THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
December 24, 1990/January 1, 1991 · Vol. XXIV · Nos. 52 & 53 · 72 Pages · $2/Copy · $48/Year

SPECIAL DOUBLE ISSUE

COMPUTERWORLD

FORECAST 1991

Blah Busters!

Tips for tight times
Page 2

Satisfying tough users
Page 6

Playing the buying game
Page 8

Plus:
Business and technology outlooks

NEWSPAPER

#63D********** 5-DIGIT 48106
#UIU7ZE300M039068# 0010108754
UNIVERSITY MICROFILMS INT 0614
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

6 XC -

Technically, It's An Architecture. But It's Really Something Else.

Freedom. Freedom to choose. Freedom to change. Freedom to grow. The basic tenets underlying the most advanced, and independent architecture ever developed.

The Computing Architecture For The 90s from Computer Associates.

Since it encompasses SAA, NAS and the other industry standards, CA90s gives you unprecedented freedom to integrate. Across platforms, operating systems, different vendors—throughout your entire corporate environment.

Today. Not next year. Next month. Next week. CA90s is here today. Unlike other architectures, CA90s is already supported by the world's broadest range of software solutions.

But that's only the beginning. The best news is in how these applications work together. By sharing common services and advanced technology, CA software brings you the highest levels of integration and automation in the world.

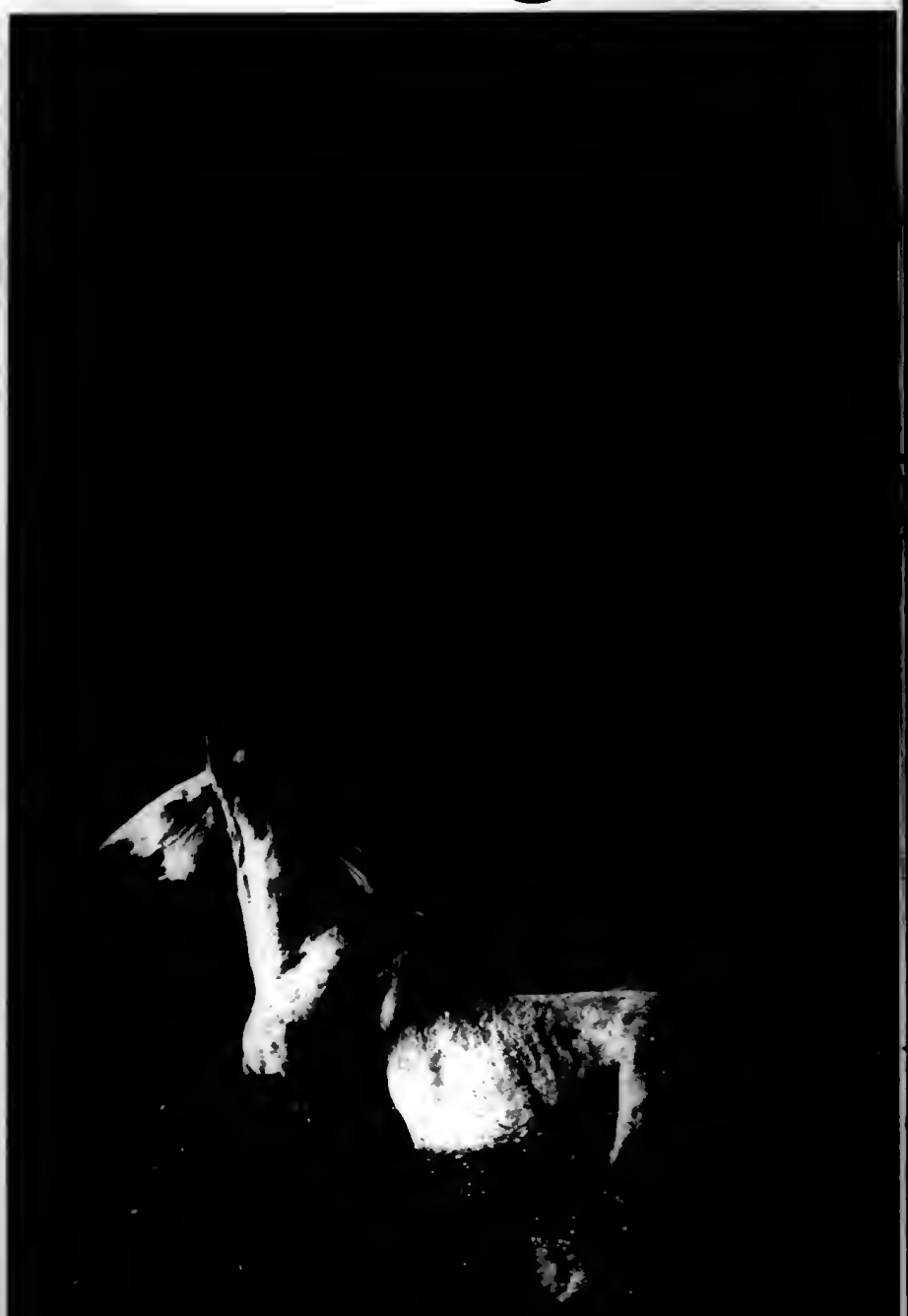
And Tomorrow. With CA90s, you'll be prepared for whatever happens in the future. It provides responsible, efficient ways to migrate to new technology, while protecting the enormous investment you've made in your existing technology.

Altogether, CA90s is the architecture that offers you the freedom to face tomorrow.

And it's ready just when you need it the most.

Today.

COMPUTER ASSOCIATES



©1990 Computer Associates International, Inc.
711 Stewart Avenue, Garden City, NY 11530-4787 1-800-645-3003
CA90s is a trademark of Computer Associates International, Inc.

COMPUTERWORLD

Forecast Editor
Joseph Maglitta
Managing Editor
Donald St. John
Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin
News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, Advanced Technology
Rosemary Hamilton, Systems & Software
Nell Margolis, Industry
Maryfran Johnson, Systems & Software
Senior Writers
Joanie M. Wexler
Richard Pastore
Staff Writers
Sally Cusack
Carol Hildebrand
New Products Writer
Gary Byrne
Research Coordinator
Kevin Burden
Features Editor
Joanne Kelleher
Senior Editors
Michael L. Sullivan-Trainor
Lory Zottola
Mary Grover Brandel
Senior Writer
Alan J. Ryan
Associate Editor
Cathleen A. Duffy
Researchers
Jodie Naze
Kim Nash
Intern
Derek Slater
Chief Copy Editor
Joyce Chutchian
Assistant Chief Copy Editor
Catherine Gagnon
Features Copy Editor
Kimberlee A. Smith
Copy Editors
Christopher Lindquist
Alice Leach Kelly
Kelly E. Dwyer
Steven J. Condon
Design Director
Nancy Kowal
Graphics Designer
Tom Monahan
Graphics Specialist
Paul Mock
Design Assistant
Marie J. Haines
Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Lorraine Witzell
Stefanie McCann
Connie Brown
Rights and Permissions Manager
Sharon Bryant
Back Issues
Margaret McIndoe
News Bureaus
Mid-Atlantic
201/967-1350
Johanna Ambrosio, Senior Correspondent
Washington, D.C.
Mitch Betts, National Correspondent
202/347-6718
Gary H. Anthes, Senior Correspondent
202/347-0134
West Coast
415/347-0555
Jean Bozman, Senior West Coast Editor
J.A. Savage, Senior Correspondent
James Daly, Senior Correspondent
Jim Nash, Correspondent
Maura J. Harrington, Correspondent
Marilyn Scott, Editorial Assistant
Midwest
708/827-4433
Ellis Booker, Bureau Chief
Michael Fitzgerald, Correspondent
IDG News Service
Penny Winn, Director
Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Fax: 508/875-8931
MCI Mail: COMPUTERWORLD
Subscriptions: 800/669-1002

IN THIS ISSUE

ISSUES

2 Squeezing more from IS dollars BY JOSEPH MAGLITTA
2 Keep management hot about technology BY MICHAEL L. SULLIVAN-TRAINOR
2 Outlook: Computer careers BY CATHLEEN A. DUFFY
6 Pacifying the power-hungry BY DEREK SLATER
8 Play the buying game with your vendor BY DONALD ST. JOHN
8 One-way street BY MITCH BETTS
10 Mini poll: How will you be spending time and money in 1991? BY JODIE NAZE
11 Europe ho! BY ALAN J. RYAN
14 Bend me, shape me BY CLINTON WILDER
14 Outlook: Government BY GARY H. ANTHES
15 Interview: Peter Keen
16 Fourth annual Dubious Distinction Awards

BUSINESS

18 A make-good year for vendors BY NELL MARGOLIS
18 Outlook: View from Wall Street BY KIM S. NASH
19 What part will they play? BY NELL MARGOLIS
20 Profile: IBM BY MARYFRAN JOHNSON
20 Profile: Bull HN Information Systems BY SALLY CUSACK
21 Profile: Unisys BY ELLIS BOOKER
21 Profile: Wang Laboratories BY SALLY CUSACK
22 Profile: Oracle BY JEAN S. BOZMAN
22 Profile: Apple BY JAMES DALY
23 Profile: Hewlett-Packard BY J. A. SAVAGE
23 Outlook: Systems integration BY LORY ZOTTOLA
24 Humor: Is this any way to begin a decade? BY PAUL GILLIN
26 *Computerworld*'s All-Star Team BY JIM NASH

TECHNOLOGY

27 Desktop bonanza ahead BY MICHAEL ALEXANDER
27 Small is big in PC land BY RICHARD PASTORE
27 Outlook: Application development and data management BY MARY GROVER BRANDEL
29 Outlook: Networking BY JOANIE M. WEXLER
30 Hello, Europe? This is the U.S. BY ELISABETH HORWITT
30 Outlook: Printers and output devices BY STEFANIE MCCANN
31 Gloom looms over high-end market BY ROSEMARY HAMILTON
31 Outlook: Desktop operating systems BY PATRICIA KEEFE
32 Outlook: PCs and workstations BY J. A. SAVAGE
33 Outlook: Storage BY MAURA J. HARRINGTON
36 Unix: Faster than a speeding bullet? BY JOHANNA AMBROSIO
36 Summit Trek: Voyage to the future BY JEAN S. BOZMAN
37 Goodbye 1990

SYSTEMS & SOFTWARE

41 No man — even at IBM — knows the hour when Officevision 2 will come.

PCs & WORKSTATIONS

43 Mac developers realize their bread is buttered better with DOS.

NETWORKING

45 Hooray for IS in Hollywood, say agents from New York to Beverly Hills.

MANAGER'S JOURNAL

47 Fear of change may be the greatest obstacle to implementing EDI in the TV industry.

COMPUTER INDUSTRY

49 3Com appears to still be providing all things to all customers.

DEPARTMENTS

38 Editorial
48 Calendar
67 News Shorts
68 Trends

outlook:
COMPUTER CAREERS

Some bright spots in the IS trenches

BY CATHLEEN A. DUFFY

Want a new job but are too afraid to make a move during these economic dog days? Worried about your present job?

If you're a senior-level information systems executive in retail or banking (yes, banking), have a strong business orientation and live in the Midwest or on the West Coast, relax. IS consultants and recruiters say things aren't looking so bad for you next year.

For other IS professionals, there are a few glimmers of hope, but you'll have to know where to look for them. The following is a summary of projected hot and not-so-hot spots for careers in 1991:

• **Midwest is best.** According to several recruiters and consultants, the heartland gives IS the most reason to take heart. "The Midwest seems to be more stable because of the diversification of industry," says John Mengelt, a partner at the Chicago Search Group in Buffalo Grove, Ill. "If something else is down in the industry, there's always something else holding it up."

Although weaker than the Midwest, the West Coast is still seen as OK. Recruiters agree that the area is stable right now but could take a downturn at any time. For senior-level IS professionals, however, "the West Coast is very much alive," says Norm Sanders, a managing director at executive search firm Russell Reynolds Associates, Inc. in New York.

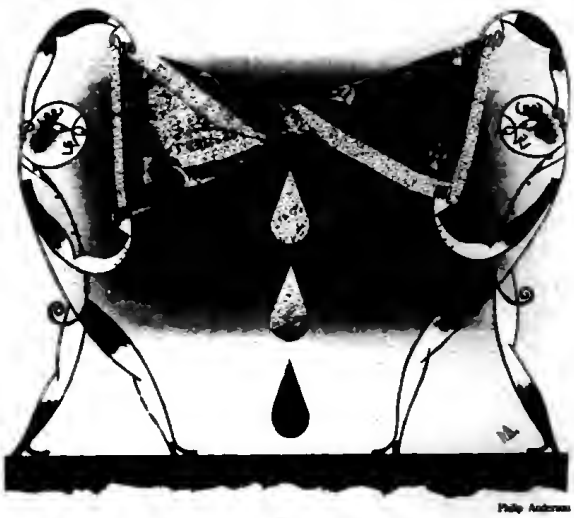
The East Coast, as nearly

Continued on page 6

Squeezing more from IS dollars

In a year of tight budgets, managers find creative ways to pinch pennies

BY JOSEPH MAGLITTA



Philip Anderson

If IS had a theme song for the New Year, it would be "Tighten Up."

Faced with leaner budgets and rising user demands, information systems chiefs in every industry are finding more creative ways to stretch their dollars.

Tactics vary, but most come down to one thing, says John Piper, director of IS at Genex Ltd., a Des Moines, Iowa, distributor of industrial and medical gases: frugality.

Strategies range from trimming staffs, reorganizing departments and off-loading various tasks to employing user groups. Contract services and outsourcing are also popular. And many IS chiefs are scrutinizing work requests much more closely.

"There's an increased intensity of focus on the 'need to have' vs. the 'want to have,'" says Denis LaHood, president of Agway Data Services based in Syracuse, N.Y. "Technology isn't just being used because it's in vogue," he adds.

There will be plenty of chances for penny-pinching in 1991: Economists predict that dreary days will continue at least through the summer and possibly longer.

IS departments lucky enough to get increases will see hikes averaging 5.3%, according to Index Group, Inc., a Cambridge, Mass., consultancy. The firm's annual survey of 394 U.S. organizations showed that while IS budgets will grow modestly in 1991, most hikes will be far less than the 10% and 15% common in recent years. "The rate of increase has slowed to inflation level," notes Chuck Callan, an Index Group vice president. "We're about at ground zero."

Other less fortunate IS departments — especially in banking, manufacturing and airlines — face cuts of between 10% and 20% and possibly more.

Because situations can vary widely from company to company, consultants and IS chiefs say there is no universal cure for recessionary blahs. In general, Callan says, companies are looking at three remedies: redefining the IS function, outsourcing and attacking software maintenance.

Many organizations are working on several fronts. A few examples are:

• At Bethlehem Steel Corp., a 550-person IS work force is

Continued on page 4

Keep management hot about technology

BY MICHAEL L. SULLIVAN-TRAINOR

Warren Harkness is learning about keeping a technology project alive the only way there is: the hard way. Harkness, information systems director at Bose Corp. in Framingham, Mass., recently lost one of the firm's management sponsors at the crucial implementation point in a new bar-code scanning project. Through hard work and hustling, he was able to locate other supporters, and the project continued.

Harkness is one of the fortunate ones.

In these days of budget pressures and business breakups, the chances of losing sponsorship for a technology project are greater than ever. Funding can be cut because of a change in company priorities, supportive managers can disappear, and the whole nature of the company can shift through a takeover or divestiture.

So how do you keep management hot on IS during cool economic times?

First, by realizing that it *is* possible. For example, Frito-Lay, Inc.'s handheld computer project was frozen for 18 months by a change in top management. Revived by its initial sponsor, who was made company president, it became one of the best-known IS successes of the early 1980s.

The following are some practical tips for keeping technology initiatives alive and well:

• **Know thine enemy.** The key to dealing with the ebb and flow of project support, IS managers and consultants say, is knowing what type of problem you're facing.

According to Ralph Loftin, an IS consultant based in Newton, Mass., the three common project obstacles are reduced funding, loss of sponsorship or management change and "distractions." The latter are business or cultural issues that divert attention from IS.

• **Reschedule.** To counter funding cutbacks, IS managers should consider rescheduling a project. It can be extended over a longer period or timing can be shortened to move up deliverables. Projects should also be recast to match the current funding realities.

"If you're facing a 30% cut, don't pull the project back. Stretch it out,"

Continued on page 4

Catching Up To Lower Cost Computing

Oracle database software lets businesses take advantage of each new generation of low cost computing.

Whatever types of computer a business buys today, there's sure to be something significantly better and cheaper tomorrow.

Yet companies continue to sink money into software that runs on only one kind of computer. Locking themselves out of newer, more cost-efficient computers.

This trap is avoidable for most companies. All they need is the right software. Software that works with virtually every computer and network. Present or future.

Oracle has become the world's largest database software company by providing just that. Software that runs on virtually every type of mainframe, minicomputer, workstation and PC.

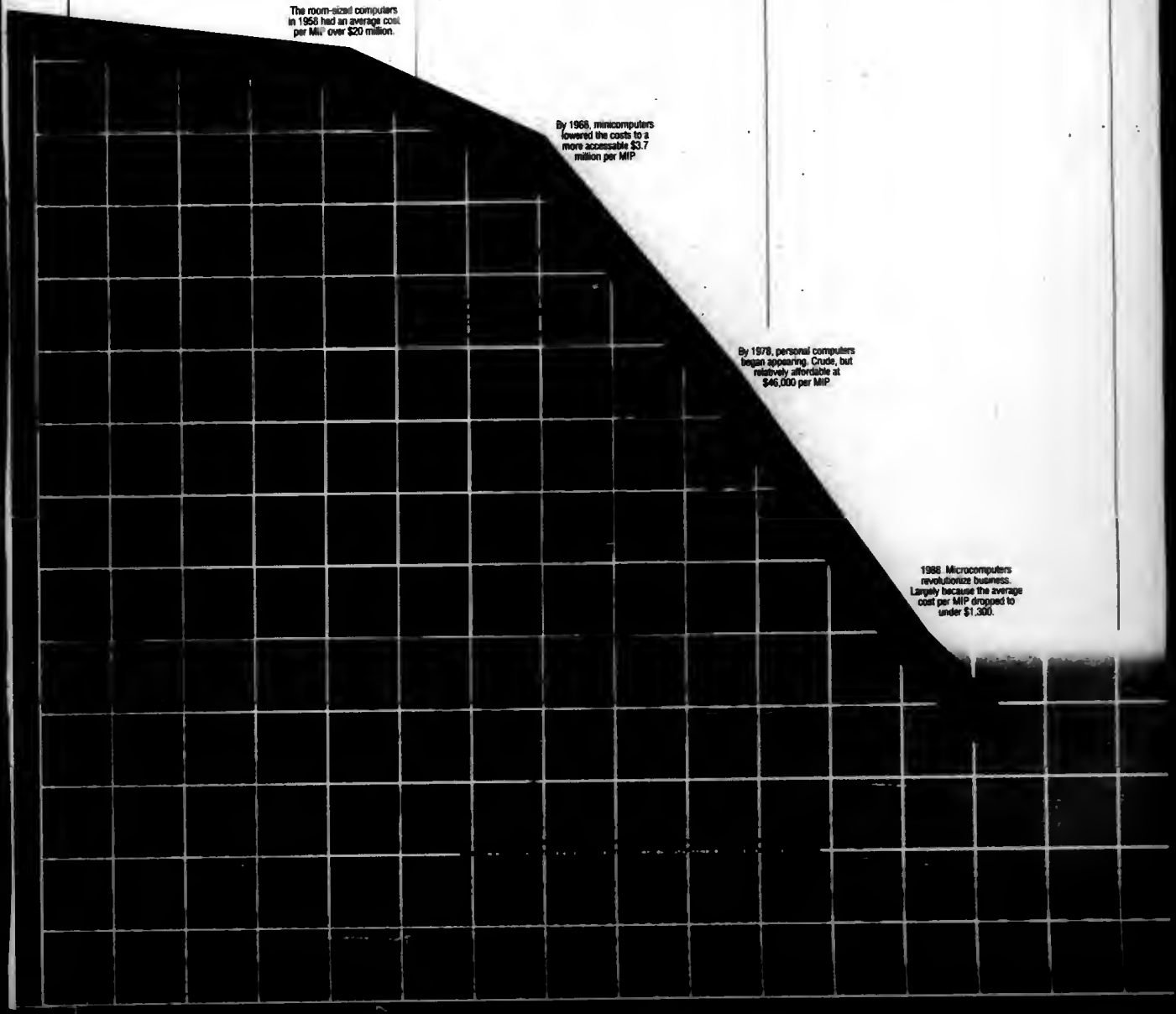
And every time a newer, faster, more cost efficient computer has come along, Oracle has provided the database software not only to run on it, but allow it to share data with existing computers as well.

Call 1-800-633-1071 Ext. 8113 for more information.

Fortunately, you no longer have to predict the future to take advantage of it.

ORACLE®

Software that runs on all your computers.



IS dollars

FROM PAGE 2

supplemented with 300 outside contractors. Merit and performance funds for permanent employees, however, are left untouched in this year's IS budget, says George Fugere, vice president of operations services.

Despite a 7% budget increase, he adds, IS projects are also chosen much more carefully at the Pennsylvania steel firm. "The skunkworks can't be off the wall," says the 34-year company veteran. "They have to stand the test of applicability."

• At Agway, a diversified manufacturer, LaHood works hard to maximize IS purchasing dollars by encouraging competitive bidding among vendors. "We don't single-source," he explains. "Competition is good for your company."

• Kendall Healthcare Products Co., a Mansfield, Mass.-based manufacturing firm, swapped an outside electronic mail contract for an in-house system.

The switch will save Kendall, which employs 8,000 people, about $120,000 per year, according to Roy Wilsker, manager of end-user services.

• Centerior Energy in Cleveland has taken several drastic cost-cutting steps. Specifically, the utility has restructured IS, greatly reduced staff levels, refinanced some hardware and consolidated three data centers into one, says Joseph Stricker, director of IS.

Moreover, all contractors and consultants have been eliminated, and some projects have been reduced in scope, Stricker says, adding: "We're looking at doing more generic applications instead of custom developing."

• At Genex, mainframe maintenance is now handled by a third party. The firm also recently purchased refurbished terminals instead of new ones.

• At Ashland Oil, Inc., the strategy is two-pronged, says D.H. Howard, director of systems: The plan is to boost the productivity of systems professionals while pushing out noncritical work to user groups.

To these ends, the Lexington, Ky., petroleum firm has rolled in various computer-aided software engineering and testing tools and is experimenting with having IBM's user support system handle end-user phone queries.

• At Caterpillar, Inc.'s Computer Technology Center in Mossville, Ill., some 900 people use PC-Write, a shareware package from Quicksoft in Seattle. At a cost of $14 per user, potential savings over commercial word processors amount to hundreds of thousands of dollars, office automation specialist Sharon Coons says.

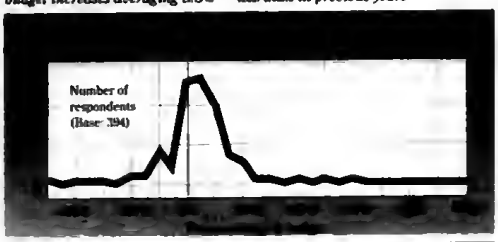
Similarly, the *Los Angeles Times* uses some 1,000 copies of PC-Write, yielding "substantial" savings, assistant systems editor Bart Everett notes.

• USAA is stretching its IS dollars by lengthening equipment write-offs on an IBM System/390 from five to seven years.

The benefit, explains Ken Thomson, is that "you use less budget money for the same equipment." The simple accounting switch lets the Houston insurer pass along cost reductions to users via lower charge-back costs.

IS budget growth slows

Many IS departments at large U.S. corporations managed to get 1991 budget increases averaging 5.3% — less than in previous years



Source: Inden Group, Inc. CW Chart: Doreen St. John

• New England Telephone's training center in Marlboro, Mass., rents extra PCs to keep costs down. "We can't afford to keep 10 printers and PCs sitting in the back room," explains Bob Benway, a billing communications manager.

Buying and selling used equipment is also becoming a popular option. At the National Computer Exchange in New York, for instance, business has jumped 250% in 1990, according to President Robert J. Zises.

Ironically, IS groups in industries that have already weathered several years of tough times might be in the best shape to handle a souring economy. Many already have tight cost-cutting and containment measures in place. "We've been pulling in our horns all along," Fugere says. "So [the current downturn] is not a big deal."

Other organizations view the poor economy as just another bump — albeit a big one— on the long path to greater corporate competitiveness.

At the Berkshire Hathaway Insurance Group in Omaha, Tom Trotter, director of IS, says fears of a recession have not changed daily operations: "We aren't hiring new positions now, but we are replacing people who leave." However, Trotter says, pay raises may be affected if things get worse.

Similarly, at Loew's Companies, Inc., the North Wilksboro, N.C.-based hardware and building supply firm, "it's business as usual," says Frank Dooley, vice president. "We are being very conservative."

But IS chiefs say that all bets will be off if a shooting war erupts in the Middle East. If that occurs, they say, IS spending will undoubtedly be re-examined.

Silver lining?

Yet despite the bleak short-term outlook, many companies say they will forge ahead with key IS projects and initiatives. Ashland Oil, for example, is developing new disposal and monitoring systems and boosting staff development funds by 25% next year. Bethlehem Steel plans to continue a $30 million steel automation project. "Because things are tight, you just can't stop paying attention to technology," Fugere says.

If there is a bright side, it's that IS departments, despite tighter reins are, in many cases, seen as more valuable than ever to their companies. These days, Strickler observes, top management is very interested in "how the systems guys can help out the departments."

It would be bittersweet, but tougher economic times could actually boost interest in information technology even more in the coming months. In the meantime, IS is working hard to make every penny count. □

CW staff member Derek Slater contributed to this report.

Maglitta is a *Computerworld* senior editor, features.

Technology

FROM PAGE 2

Loftin advises. "In tight budget times, people are more concerned about getting more bang for the buck, so moving up the payback should help."

• **Share responsibility.** Another tactic for handling money problems is to let the business group share responsibility for funding and executing the project. "Once we get beyond the pilot stage, each project has joint sponsorship, and users pick up a large proportion of the cost," says Al Hyland, Polaroid Corp.'s IS director.

• **Get a new sponsor.** Changes in business sponsorship can be the toughest challenge for IS. The best prescription: Find a new champion *fast*. To secure the support of another influential executive, managers should determine how the project benefits the targeted sponsor and then sell it to him.

"You have to re-examine and confirm the benefits," Loftin says. "It's also important to relate them to the broader operation and strategy rather than deal on task level."

• **Show broad benefits.** When the change in sponsorship involves losing an executive, the dangers to a project can increase. That's because the new executive may want to assert his own plan and freeze everything that came before. Doing so is difficult if the project has intrinsic value to the whole organization. So it's up to the IS manager to make the case for broader benefits.

• **Sell, sell, sell.** How hard you have to work to keep projects going depends on the technology. New technology initiatives, for example, require constant selling by IS, because there's little proof that they will succeed.

Case in point: Poor interest threatened widespread use of computer-aided software engineering (CASE) at The Traveler's Corp.

Seeing a move toward corporate downsizing, IS made CASE a key unit in a new Application Services Division. The move created higher visibility and changed CASE from "an experiment to a contributor to productivity," says Susanne Niedzeilska, Traveler's manager for CASE application projects.

Even with this new support, Niedzeilska says she continually has to keep priming the pump of sponsorship interest. She does this by offering presentations on CASE benefits as they are achieved within the company.

"People sign up for a project because there is attention on it. After that attention fades, you have to face the inertia. You have to provide momentum through achievement of paced, short-term objectives," she says.

• **Enlist user support.** Another tactic to keep projects going is to get users to speak to other users about project benefits.

To recruit spokesmen for the project, IS managers should go back to supportive users and have them reassert their views of the project value. This can bring others around and prevent funding reductions, according to Loftin.

• **Compare data with "the enemy."** Outside information about competitors' activities can add new force to an IS manager's case.

Be warned: This tactic requires as many specifics as possible. The best case is made when competitors are using the same technology and getting a strategic advantage.

"It then becomes a competitive disadvantage if the project isn't accomplished," Loftin says.

• **Never stop communicating.** At Bose, Harkness spent most of his time "destroying myths" about the bar-code project. Project updates were put on the agenda of the management advisory council, which included the company president, vice presidents of manufacturing, finance and engineering, the general manager for audio systems and other directors.

The pitch — which involved describing project benefits and detailing accomplishments — was well received. In one move, Harkness created awareness of his plans, eliminated negative opinion and dispelled incorrect assumptions.

• **Get out of the rat race.** The ultimate in protecting against loss management support is to stop playing the game altogether. That's what they did at Whirlpool Corp.

"We've just put in a new system to escape the conflicts of finding support for IS projects," explains Richard Koeller, vice president of information technology. The "value-oriented" process combines planning and budgeting. The result is that "users stay in control. IS takes over after the priorities are set and the resources are allocated." □

Bose's Harkness *knows the importance of project leadership*

Sullivan-Trainor is a *Computerworld* senior editor, features.

Oracle sets client/server OLTP performance record.

The new audited ORACLE® benchmarks show transaction-per-second (TPS) scores from 21 TPS with a 200 megabyte database on a PC, to 416 TPS on a mainframe with an 8 gigabyte database. These were industry-standard TP1 tests independently certified by Codd & Date.*

This scalable performance means ORACLE not only runs everywhere, it runs everywhere faster. Faster on a single machine. Faster in a client/server configuration. So no matter what system you choose, you get the best performance and lowest cost per transaction. No small concern to managers trying to squeeze the most out of MIS/DP budgets.

1-800-633-1071 Ext-8116

But don't just take our word for it. Call, and ask for the benchmarks reports audited by Codd & Date. They certify the test results and give a full account of the testing methodology and system configurations. Just the thing for a little speed reading.

ORACLE®

Software that runs on all your computers.

©1990 Oracle Corporation, ORACLE is a registered trademark of Oracle Corporation. All trade names referenced are the service mark, trademark, or registered trademark of the respective manufacturer. Call 1-800-ORACLE1 for hardware and software requirements.

Pacifying the power-hungry

Tips for handling MIPS-gobbling users without breaking your IS budget

BY DEREK SLATER

You have locked yourself in the castle, your meager supply of rations dwindling with each passing day. Carrion birds wheel through the darkened skies overhead, their calls shattering your fitful attempts at work. And outside the buttressed stone walls, an ever-growing horde of torch-bearing users cry out their demands, hammering at the giant oak door. How can the maddened crowd be pacified?

It's a recurrent nightmare and, increasingly, a reality that must be faced by information systems departments: End users clamoring for more power, speed and resources even as IS budgets groan under the growing weight of recession.

"Our load keeps going up, but we haven't really added staff," says David Long, director of IS at The Hotsy Corp., a high-pressure pump manufacturer in Englewood, Colo.

Long is not alone. Other IS executives say they expect user and budget pressures to grow even stronger in 1991.

"We've already received a bid from a user for the first 786-based machine we buy," says Roy Wilsker, manager of end-user services at Kendall Healthcare Products Co., a Mansfield, Mass.-based manufacturing firm that employs 8,000 people. "It's only partly tongue in cheek."

Where are the new demands coming from? Problem groups differ from company to company. But customer service, marketing, sales, accounting and administration top the list of users vying for attention from IS departments.

R. M. Kato

Increased user needs stem predominantly from a growing awareness of what technology can do. "People have discovered how much they can do with micro-based departmental systems and networks," says Robert Goldberg, vice president and manager of end-user computing at Providence, R.I.-based Old Stone Bank.

In the increasingly competitive business climate and job market, workers are eager to get the edge that new technology can provide. "They feel it will help them increase their productivity," Goldberg says.

Faced with the twin pressures of busier technical staffs and more demanding users, resourceful IS managers are finding ways to keep in-house customers smiling.

• **Empower users.** One common solution is to teach user groups to do as much as possible on their own.

At Kendall, efforts have centered on helping users retrieve more crucial information by themselves. Doing so lets users get their data faster, Wilsker says, "and also lets us leverage our time better to concentrate on more intensive IS functions." Like many companies, Kendall's central IS group now sponsors classes for end users.

Entergy Corp. is also focusing on helping users provide for themselves. Director of IS Planning Cy Hoorman has given many technical support responsibilities to staff members within end-user departments.

"In the past, the value-add that IS brought was familiarity with the technology," Hoorman notes. "Once the user departments reached a level of technical sophistication, we saw no reason not to turn that function over to them."

As a result, some of the expense can be passed along to the user departments, freeing IS dollars for other purposes.

Another benefit is faster service. Managers say support from the user department is usually quicker than sending someone over from IS.

• **Provide remote support.** Wilsker has developed another solution to the quick service problem: remote support. Kendall has purchased software that allows central IS to explore any user's personal computer over telephone lines. "To save time, we want to be able to just dial up any PC and poke around to see what the trouble is," he explains.

• **Exploit technology.** Another simple, yet effective, way of keeping users happy is to make sure existing technology is being used efficiently by IS.

For example, at Transport Life Insurance Co. in Fort Worth, Texas, phone lines were reprioritized to speed up user queries. Requests for policy information now go to the head of the phone queue, rather than waiting while less critical transactions fill the lines, according to Ronald Willis, vice president of MIS.

• **Get a plan.** IS managers say tougher economic times make it especially important *not* to treat the growing weight of end-user requirements haphazardly.

"It's a big enough issue that we're going to have to take a long look at it all, not just make a change here or there," Long says. □

Slater is a *Computerworld* staff member.

IS trenches

CONTINUED FROM PAGE 2

everyone knows, has an economy that's in the pits and sinking. But some recruiters remain optimistic, even upbeat. "Even though the papers say everything is falling apart, I don't think it's hopeless," says senior consultant Barbara Gibbs at Edward Perlin Associates, Inc. in New York.

She says that despite the blahs, there are still jobs at all levels, especially for systems architects and technical researchers.

• **Hottest jobs on the top, bottom.** Most recruiters agree that the greatest demand will be for low- to midlevel nonmanagement workers and top-level chief information officers.

In Houston, for example, the big need is for programmers and analysts, says John Froberg, associate director at recruitment firm Source EDP. "There are a lot of senior people down here, so there's ample talent to fill a position such as MIS director," he says. "Companies are tapping talent outside of the Houston area to fill junior- to midlevel positions."

Davis Gallison, a senior consultant at Coopers & Lybrand in Boston, agrees that on the troubled East Coast, lower level IS staffers will find more job opportunities than midlevel IS managers.

But recruiters across the nation say the biggest winners will be those on the CIO track.

"Technology is key, but the people who manage the technology are more important right now," says Steve Fogel, director of research at Korn Ferry International in San Francisco.

Recruiters add that placements for CIOs are much higher than for other IS job titles, which means more openings and better salaries.

• **Raises to vary.** In the hottest industries, high-level professionals can expect 15% to 25% pay increases this year. But recruiters say most gains will be more modest.

Projected hikes: Houston area, 5% to 8%; West Coast, approximately 5% but more bonuses; New York, about 6%.

In the Chicago area, firms are wavering too much to state an average raise figure, says John Rothschild, partner at Heidrick and Struggles, Inc. But he adds that top IS people with a business bent are "worth more than their weight in gold."

• **Bank on banking.** It's no joke. Recruiters say IS professionals will be greatly needed to help restructure systems and information flow at financial institutions that have been merged or downsized.

That's good news for everyone from programmers to IS managers, Gallison says. A range of skills, from re-application development to management, will be needed in overhauling and rethinking the systems, he explains.

Other IS growth areas for 1991 are likely to include retail, consumer goods and health care, recruiters and consultants predict.

• **Think globally, work locally.** Companies with a strong worldwide focus are expected to produce opportunities for IS professionals. In particular, Sanders says, globalized pricing and inventory will attract a lot of technology dollars.

• **It's worse in accounting.** Even with mixed prospects, IS workers are better off than colleagues in many other departments. "Overall, I don't think IS opportunities across the board and across the country will be hurt as much as other types of [office positions]," Mengelt says.

According to Gibbs, top-notch IS professionals will always be sought after, regardless of whatever downsizing takes place.

But recruiters warn against complacency. "Where once a company might have settled for a little less than they wanted — like a non-MBA — now they demand it," Mengelt says. □

Duffy is a *Computerworld* associate editor, features.

Finally, The Promised LAN

Oracle Client/Server Systems are open, portable, integrated. And here.

Oracle's integrated family of products lets you take everything you've read about client/server systems in the magazines and put it to use in the workgroup. Combining the economy and flexibility of PCs with the performance and integrity that used to require a mini at the very minimum.

ORACLE is portable. Giving you the widest choice of desktop servers: OS/2, six different UNIX systems and shortly, both Netware and Macintosh. ORACLE also lets your existiog minis and main-frames act as servers to desktop machines.

ORACLE works with all your existing networks. Or any networks you'd like. Novell Netware 286/386, IBM LANserver, Microsoft LAN Manager, Banyan VINES, TCP/IP, and many others.

And it goes without saying that because ORACLE is open, it supports all the front ruoniog front-ends. Including Paradox, Lotus 1-2-3, even Dbase applications.

Or you can develop your own client applications with Oracle's integrated set of development tools. Includiog a powerful 4GL, screen generator, report-writer and menu generator.

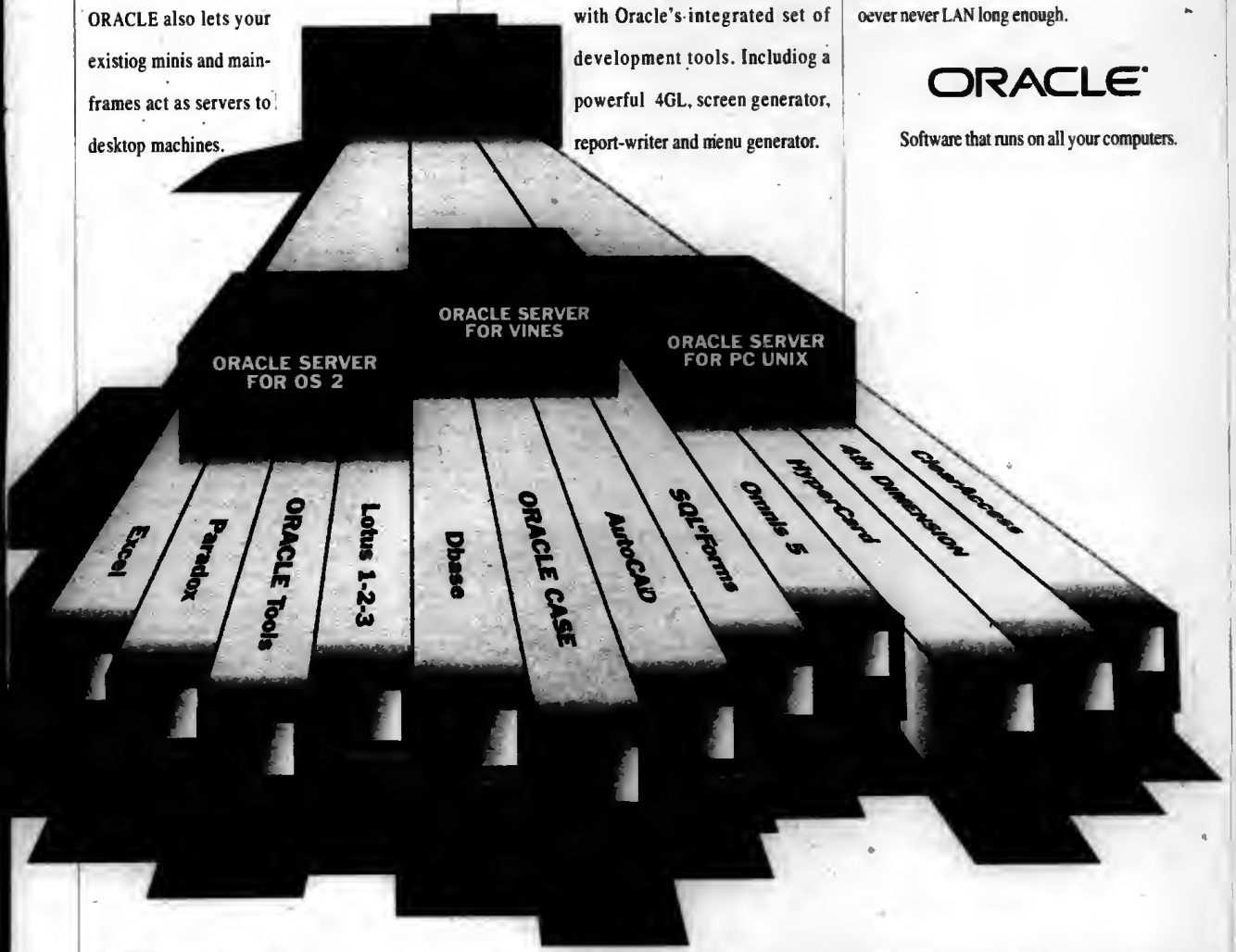
But more than just software products, Oracle provides all the support services to fully transfer client/server technology to you. These services, combined with ORACLE software products, guaraotee your technology investment.

1-800-633-1073 Ext. 8119

Call for more ioformation, or to register for an Oracle Client/Server Forum. You've been stuck in oever never LAN long enough.

ORACLE

Software that runs on all your computers.



©19 racle Corporation. ORACLE is a registered trademark of Oracle Corporation. All trade names referenced are the service mark, trademark, or registered trademark of the respective manufacturer. Call 1-800-ORACLE1 for hardware and software requirements.

Play the buying game with system vendors

Staying on top of the action in the industry can pay off in big savings when it comes time to make a purchase

BY DONALD ST. JOHN

"Every dollar counts."

In 1991, that maxim may be more true than ever. Information systems managers everywhere are expecting to have to use their budgets to the fullest, as companies try to do as much or more with fewer workers and less overhead.

The choice of tools was once mandated by the question, "What do we need to stay ahead?" That question is as important as ever, but now it's joined by its crucial counterpart, "How can I afford it?"

Affording often means getting the best deal possible from your vendor — and don't forget that your vendor is also trying to compete in a tightened economy. There are probably as many strategies for this as there are possible deals, but interviews with users revealed a number of approaches that are worth considering.

• **Do your homework.** The IS manager who knows as much as possible about what's available is most likely to get a bargain.

"I can't emphasize enough learning the economics of the [computer] business," says Tom Loane, director of information systems at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "You've got to do hard homework to understand what's going on. If you don't, it's a very expensive way to learn."

Your grunt work shouldn't be limited to the specific product in mind, either. An imprudent buyer may make some gains on the product front, only to lose them in service terms and financing.

• **Read. Talk. Then read some more.** You can never have too many information sources, buyers say. Keeping abreast of the trade press is a must, as is reading such general business publications as *The Wall Street Journal* and *Business Week*.

Equally important is working the telephones to maintain market sources. "With PC dealers, we ask them to do some work for us — tell them, 'Find the best of X' and ask them to also help us find the best deal on that," Loane says. Don't forget to reward a successful effort with a good level of business, he adds.

• **Show what you know.** "The best tactic I have is to make sure my vendors know that I shop around," says Jacqueline Bynsdorf, personal computer support coordinator at Jockey International, Inc. in Kenosha, Wis. "When they know that, they know right away that I'm aware of the basic range of available price levels."

In larger companies, local purchasers can lean on their central IS buyers for information. "Our local groups can use our price to beat up a little on their local vendors, and I suspect they do it a lot," says Dave Strahan, manager of MIS administration at the Riverside, Calif.-based maker of motor homes and recreational vehicles.

• **Be up front with the vendor.** Surprisingly, the buyers surveyed don't always advise talking with vendor A, then turning around and calling vendor B to bid the price down.

Michael Klein

"If you do that, where does it stop?" Bynsdorf asks. "It would be in my best interests from a purchasing standpoint, but I also need to maintain support from [the vendors] to make sure that service stays good. I'd rather keep a good relationship with them and keep them aware that I do know what's available and for how much."

• **Don't shy away from working with your suppliers.** Establishing a solid partnership is another route to a "preferred customer" status that can yield benefits across a broad spectrum. C. W. Randall, vice president of telecommunications at Citizens and Southern National Bank of South Carolina, says alliances with AT&T, Bellsouth Corp. and Comdisco, Inc. have created partners that "know this bank and the people in it as well as anyone knows it."

Randall says his organizational chart at the bank, a Columbia-based subsidiary of CNS Sovran Corp., even has those firms listed. "They sit in on planning meetings, and they're free to go into any department or branch and work with the people there.

• **When necessary, call their bluff.** Of course, business is still business, and everybody's looking for an edge. Don't lose yours. "I don't want to spend time horsing around with the wrong things," Loane says. "Maybe I'll get one silly number from someone once, and I let them know. If they do it again — well, I don't *have* to work with them."

Bynsdorf employs an interesting strategy. When she gets a high quote from someone, she says she lets them know — and refuses to let them lower it. "Rather, I wait until the next time, and they'll usually come in lower on the next call," she says. □

St. John is a *Computerworld* senior editor, features.

A one-way street

Fortress Europe may bar transfers of personnel and customer data to the U.S.

BY MITCH BETTS

Sure, you can use that new global network to zap a personnel file to your office in Paris, but you may not be able to get it back to the U.S. again.

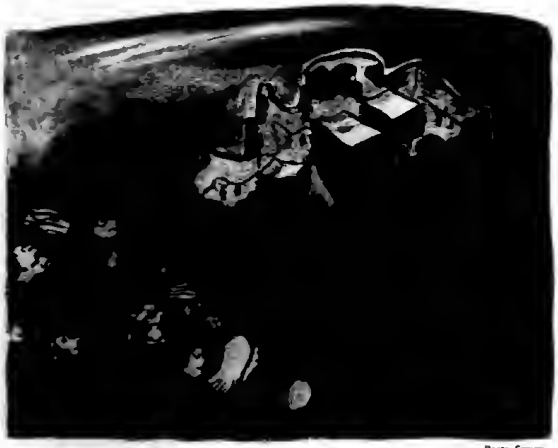
A proposal to regulate European databases of personal information — now winding through the European Community's superbureaucracy — would prevent the transfer of personal data from Europe to the U.S. if U.S. privacy laws are judged to be too weak.

"This has really frightened American multinational industries that are used to transferring personal information from one country to another with reckless abandon," says David H. Flaherty, a privacy expert at the University of Western Ontario.

Not surprisingly, American businesses are lobbying against the privacy directive, which is expected to be debated, revised and approved in 1991.

The measure stems from Europe's effort to achieve uniformity in its data protection laws and thus make it easier to transfer data among countries in the unified Europe of 1992. In essence, the European Commission wants to bring the five European countries that lack privacy laws — Belgium, Greece, Italy, Portugal and Spain — up to the level of countries (notably, France and Germany) that do have strict regulations.

The "transborder data flow" problem caused by uneven privacy laws has already snared some organizations, including the car company Fiat S.p.A. In 1989, a dispute with the French government's privacy commission over moving personnel files was resolved when Fiat agreed to follow French law.


Beata Sapara

Like the French and German privacy laws, the European Commission's draft proposal is based on the principle that people should have control over information files about them, including "informed consent" for the collection or transfer of personal data. The fundamental debate is whether that notion is too old-fashioned for the split-second world of interactive data communications and manipulation.

As a practical matter, getting permission from everyone in the database would stifle the free flow of information about financial transactions and credit reports, as well as employee and customer databases, according to Kenneth B. Allen, senior vice president of the Information Industry Association in Washington, D.C. "The major concern is that

Continued on page 10

Give us one day. and we'll give you the future.

Announcing Directions '91 IDC's Annual Computer Industry Briefing Session

Take a unique look at the global computer industry, as we probe the issues and trends impacting users and vendors, alike. Understand the state of the industry today, and what's ahead for tomorrow as International Data Corporation, the world's leading market research, analysis and consulting firm on information technology, presents its 26th annual briefing session.

Find out why the leading computer systems companies are losing market share ... what the priorities are for user budgeting and spending ... which major distribution channels face demise in the 90's ... how open systems and standards will shift control from IBM ... what tactics successful PC suppliers are using ... and much, much more.

In just one day, you'll get the best market data, analysis and insights from the industry's top analysts.

IDC 1991 BRIEFING SESSION SCHEDULE

March 4 • Washington, D.C.
March 5 • New York City
March 11 • Dallas, Texas
March 13 • Costa Mesa, CA
March 14 • San Jose, CA
March 19 • Boston, MA

1991 AGENDA

Industry Agenda: 1991
Axel Lehlois, Chairman and CEO, IDC

1991 U.S. IT Spending Outlook
David C. Moschella, Sr. V.P., Worldwide Research, IDC

The Shifting Fortunes of the Networking Industry
Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry
Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's
Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

Managing Channels for Growth
Lee M. Levitt, Dir., Distribution Channels Research, IDC

Workstation Evolution: Up or Down
Vicki J. Brown, V.P., Systems Research, IDC

The 1991 PC Market: Which Way Will Pay?
Aaron Goldberg, V.P., Desktop Computing Research, IDC

If you need to know how and why the computer industry is changing, don't miss the IDC Computer Industry Briefing Session.

The IDC Annual Briefing Sessions are sponsored by International Data Corp. (IDC) the world's leading market research, analysis and consulting firm, specializing in the information industry. The sessions are produced by World Expo Corp., a leading producer of professional conferences, seminars and trade shows for the computer and communications industry. IDC, World Expo Corp. and Technology Investment Strategies Corp. are International Data Group companies, the world's leader in information services on information technology.

Register Early and Save $100! Attendance is limited and sessions are expected to fill quickly.

IDC
INTERNATIONAL DATA CORPORATION

☐ YES. I want to attend Directions '91, IDC's 26th Annual Briefing Session. Please send me a complete registration package.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____ Fax _____

Registration Fees: $525 full registration • $425 early-bird registration (Save $100 if received before February 15, 1991). Please ask about client, government and group rates.

Please call 800-225-4698 or return this coupon to: IDC Industry Briefing Session
World Expo Corp., 111 Speen Street, Framingham, MA 01701-9107.
Can't wait? Reply by fax: (508) 872-8237

7FCWA

One-way

CONTINUED FROM PAGE 8

the draft is totally unrealistic and onerous," he says.

However, Martin Bangemann, the commissioner in charge of the directive, argues that privacy is a fundamental civil right of Europe's citizens and that it must "not be sacrificed one-sidedly for economic interests."

Europe's privacy advocates are worried that businesses may evade the rules by moving their information processing operations to "data havens" (countries with little or no privacy protection).

Consequently, the European Commission's proposal bans the transfer of data to outside parties that lack "adequate" privacy laws — a characterization that might include the U.S.

The U.S. may be able to overcome this if it passes a bill sponsored by Rep. Robert E. Wise Jr. (D-W. Va.) that would create a nonregulatory Data Protection Board to advise the public and private sectors on privacy issues [CW, May 21]. But even this bill, which is far from being passed, may be too weak to satisfy Europe.

How good is U.S. privacy?

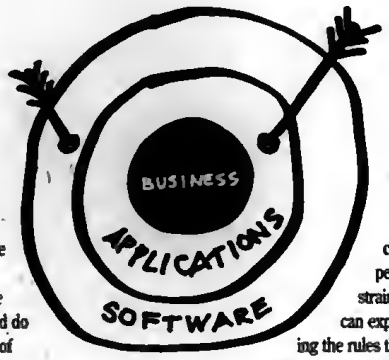
The question of whether privacy protection in the U.S. is really deficient has not been answered. The U.S. does not have an all-encompassing federal privacy statute, but it does have privacy laws in certain sectors, such as electronic mail, as well as numerous state privacy laws.

U.S. corporations will be trying to make that case as they lobby the groups that handle pan-European policies — the European Commission, the European Parliament and the Council of Europe.

However, the Europeans will not take kindly to criticism from Yankee businesses. Changes in the directive are more likely to come from lobbying by European businesses that happen to share U.S. concerns, as well as from the conservative German and UK governments, says G. Russell Pipe, publisher of the monthly journal *Transnational Data and Communications Report* in Burke, Va. □

Betts is *Computerworld's* national correspondent, based in Washington, D.C.

As long as the aim of CASE vendors is better software, they'll be off-target.



The aim of CASE should be better business.

"Self-evident," you say? Well, not from what you see and hear in the CASE marketplace.

At BACHMAN, we have some unique ideas about what CASE should do for the enterprise. And unique ways of helping you hit what you're aiming for.

technical details of implementation when specifying and designing systems. Companies can respond to changes in business requirements independent of the opportunities or constraints presented by the technology. They can exploit technical innovations without altering the rules that define the business. The result? Synergy, not conflict.

Help business people understand technicians Help technicians understand business

Companies realize their full strategic potential when business can talk to MIS and vice versa. For the first time, with the new BACHMAN/Analyst™, an entire enterprise can speak a common language—rich enough for non-technicians to understand, precise enough to create software that works well.

Companies can build reliable systems quickly, and go about the business of doing business competitively.

Create a complete business model— Always responsive to change

Staying competitive means first, staying ahead of the changes imposed by the real world of business, and second, having the means to exploit advances in information technology. In both cases, BACHMAN offers a unique advantage.

BACHMAN products decouple business needs from the

Generate production-quality systems— Systems that remain current

A BACHMAN business model is readily translatable to high performance systems. Surely a boon to new systems development. And the BACHMAN business advantage only begins with new development.

The recognized capabilities of the entire BACHMAN/Re-Engineering Product Set® mean that business models are kept current, technology designs are easily optimized, and application systems are readily maintained and enhanced. Sound good?

There's a great deal more

We've only begun to zero in here on the competitive advantage BACHMAN represents to your organization. Information about seminars, and substantial proof of what we say, is available. 1-800-BACHMAN Please call to find out the ways in which our aim is true.

BACHMAN

For more than software. For business.

8 New England Executive Park / Burlington, MA 01803 / Phone: (617) 273-9003 Fax: (617)229-9904

IBM Business Partner

[illegible] BACHMAN/Analyst is a trademark and BACHMAN/Re-Engineering Product Set is a registered trademark of Bachman Information Systems, Inc.

MINI POLL

How will you be spending time and money in 1991?

"We are planning to split our production into two different systems and toward the end of 1991, put them back on a single system. Right now, we have a System/38 Model 700 and two Application System/400s."

Frank D. Nester, *director of data processing, Summit Consulting, Inc., Lakeland, Fla.*

"We will be buying PC-related software and spending money on mainframe direct-access storage devices. Our mainframe system is an IBM-compatible Amdahl computer, and we have several hundred IBM-compatible PCs.

The DASD purchase is just for corporate data growth, the programming tools are an attempt to make our programmers more efficient, and the PCs and the PC software are our attempt to have a more controlled design environment."

Robert Kramer, *director of software development, Student Loan Marketing Association (Sallie Mae), Washington, D.C.*

"Everything that we are putting major efforts into in 1991 revolves around the questions of either customer satisfaction or total quality — from the corporate perspective down to an internal IS perspective. Things high on our list are general measurement of business activities, better documentation, better business flows in the company and benchmarking.

"We are dealing with linkage issues such as electronic data interchange. We have also started customer surveying to get a better idea of what expectations are."

Michael J. Thorsen, *vice president and chief information officer, Datacard Corp., Minneapolis*

"Out of a budget of approximately $52 million dollars, we will be spending $25 million dollars on existing people, $15 million dollars on hardware and the rest on communications.

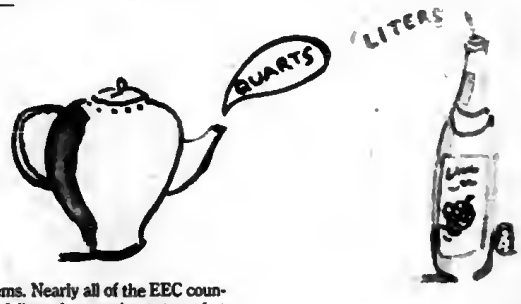
"I expect we will be in a [computer-aided software engineering] pilot project. We may start an artificial intelligence project, and we may be doing a little R&D for imaging."

Don Kanonnann, *senior managing director and chief information officer, Bear Stearns & Co., New York* □

JODIE NAZE

Europe ho!

A guide to the subtler IS issues expanding into Europe



BY ALAN J. RYAN

For information systems managers in U.S.-based companies planning to do business in the new unified Europe, Big Ben's ticking is a reminder that there is no time to waste.

While analysts say it's unlikely that every goal outlined by the European Economic Community (EEC) will be completed by Dec. 31, 1992, many of the plans to lift trade barriers will be implemented during the next two years.

The most obvious concerns of companies doing business in Europe, or hoping to do so, involve systems and telecommunications compatibility. However, experts say there are many more subtle issues that also need to be studied.

According to international consultants and IS managers who have set up operations in Europe, IS groups in 1991 need to help their companies rethink how information technology can be better deployed in various areas.

At Polaroid Corp. in Cambridge, Mass., for instance, the IS department is helping simplify overseas trade and developing Europe-wide pricing systems. "We have to do some consolidation of our software across several countries," explains Al Hyland, director of worldwide systems.

Yet IS managers will need to look beyond the technical aspects of Europe 1992, says John Diebold, chairman of The Diebold Group, Inc. in New York. Broader issues of overseas data center consolidation, staff downsizing and IS departmental structures must also be considered, Diebold says.

According to users and analysts, several business functions will be considered most important in the coming year for IS managers at companies expanding into Europe:

• **Distribution and inventory control** offer great opportunity for IS impact in the new Europe, says Shaku Atre, a partner at Rye, N.Y.-based Atre Computer Assistance, a division of Coopers & Lybrand.

A good example is American Cyanamid Co. in Wayne, N.J. In 1991, the IS group at the pharmaceutical firm will continue work on systems to improve the company's distribution throughout Europe. This in turn "will lead to improved customer service," says Robert L. Jarecki, director of international information services.

• **Marketing and sales** will feel the changes of the European Community even more than manufacturing, consultants say.

However, companies planning to develop or consolidate systems for these tasks should plan carefully, Atre warns. Different cultures require different marketing approaches, she notes. For example, an advertising campaign that may succeed in Germany may fall flat in France. Thus, a continentwide pitch and unified supporting systems are unlikely to work. "No computer system is going to change the culture overnight," Atre says.

Another related challenge for IS is converting sales commissions into different currencies. For instance, if a Rome-based salesperson sells something in Sweden, or vice versa, IS will need to devise an equitable system for handling conversions. With currency exchanges changing daily, this won't be easy, consultants say.

• **Manufacturing** presents another, though more subtle, challenge for IS. The basic problem, consultants note, comes from dealing with two different weight and measurement systems. Nearly all of the EEC countries follow the metric system, but the UK and the U.S. do not. Thus, transferring manufacturing equipment between different countries could be difficult and would require software that could accommodate and translate the different systems.

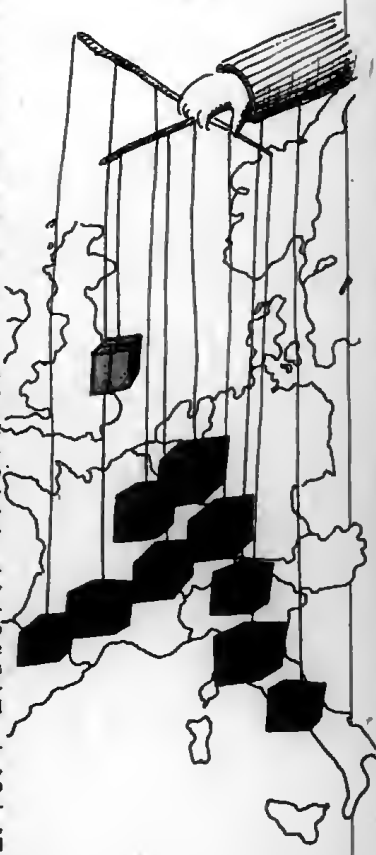
• **Data protection,** privacy laws and national sovereignty issues will also affect IS, says Aidan Walsh, international director at KPMG Peat Marwick and director of its Europe/USSR Center. "Someone in France might wonder whether someone in Spain should have the right to access information on French citizens," he says (see story page 8).

Issues related to transborder data flows may mean that U.S. companies doing business in Europe will need to create a new type of IS worker, such as senior vice president of international communications or transborder data, Walsh says. That job should involve ensuring that the company complies with not only international law but also with U.S. and European law.

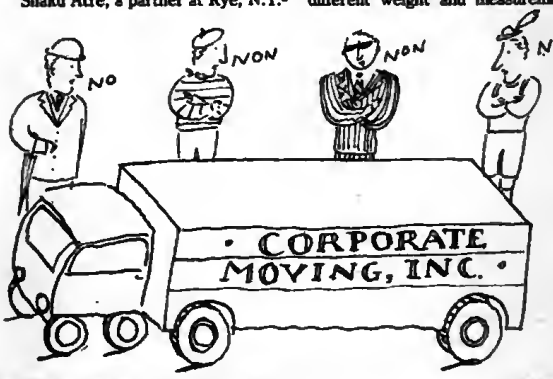
• **Human relations** and cultural differences in each European country could also affect IS and personnel systems. Many Europeans are averse to moving from city to city, let alone country to country, Atre notes. This means that firms with plans to centralize application development will probably have to hire new workers.

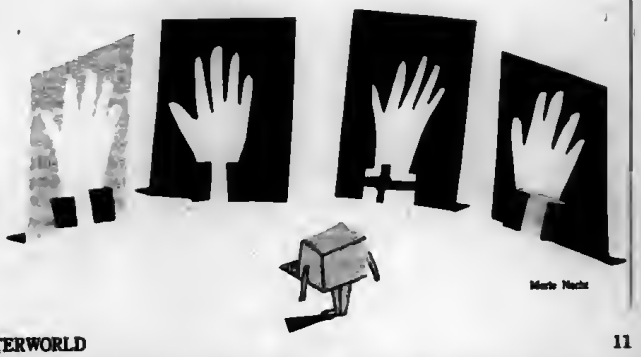
Even when companies are successful in persuading people to move, there will be other issues for IS to grapple with, including varying compensation plans, retirement plans, payroll, medical benefits and several other areas of concern.

"Human resource systems would have to evolve to allow for options packages that would differ country by country," Atre says. The biggest challenge, she adds, will be to avoid building a human resources system that becomes complex and too difficult to manage. □



Ryan is a *Computerworld* senior writer, features.





"We needed new technology to turn our passion for customer service into results. That's why we chose SAA."

Jay Dinwoodie, Senior VP/Information Systems, GE Capital Fleet Services

While some companies are wondering what IBM SAA™ can do for them, the people at GE Capital Fleet Services already know.

And so do their customers.

The company is America's leading car and truck fleet services business, and their goal is to cement that position by changing the rules, by redefining the word *service*.

SAA, or Systems Application Architecture,™ is key to that strategy.

They've built a complete SAA system, with a variety of applications running cooperatively on three IBM platforms: an ES/3090,™ an AS/400® and a multitude of PS/2s® using OS/2.®

Easy to build.

According to Jay Dinwoodie, development has been quick and smooth.

"We implemented the first modules in March '90, and since then we've been adding new ones like building blocks. Which is the whole idea. SAA lets us hook things together—data, image, you name it—in ways we never could before. What we're doing here today could *never* be done the old-fashioned way."

Jay's users agree, especially the 45 mechanics who man the phones helping customers who have car trouble.

With SAA applications in multiple windows, they provide a level of service that's truly unique: diagnosing the problem, finding the best nearby garage, estimating the cost, negotiating discounts, determining warranty status, scheduling preventive maintenance and more, all while keeping detailed records, in minutes, in one phone call.

To a salesman stuck on the road, that's money in the bank. Ditto for GE Capital Fleet Services.

Easy to learn.

Says Jay, "We bring customers in and show them what we're doing. Nobody walks away unimpressed, and in fact, SAA's helped us win a number of new accounts."

Another big SAA advantage is training time, or lack of it.

"When we first got running, we went to the mechanics' area for a training session, to get some thoughts for writing a manual. We started at one end of the room, spent a few minutes with each guy, then moved on. We weren't half-way across the room when the first people were actually using the system, doing real work. We never did write a manual."

Easy to live with.

Their system is now running about 35,000 PC-host transactions a day, and Mr. Dinwoodie estimates that traditional technology would require about 250,000 transactions to accomplish the same work. He says, "Our SAA apps are just incredibly efficient, and they've been completely reliable."

How strange that some people are still asking if SAA is for real.

"It's just a question of confidence," says Jay. "We knew exactly where we wanted to go and that ultimately SAA was the only way to get there. So we took that first step, we've never looked back, and expectations—both ours and our customers'—have been exceeded."

IBM®

© 1990 IBM Corporation. IBM, AS/400, PS/2 and OS/2 are registered trademarks and SAA, Systems Application Architecture and ES/3090 are trademarks of IBM Corporation.

A slow year? Not in Washington

outlook: GOVERNMENT

BY GARY ANTHES

A weakening economy may idle some in the computer industry, but industry lobbyists will stay busy in the new year, tracking and pushing diverse issues through the courts, the halls of Congress and the dockets of the regulatory agencies.

• **National supernetwork.** Attention will continue to go to a program for developing a national multigigabit/sec. research and education network.

A bill introduced by Sen. Albert Gore Jr. (D-Tenn.) was approved by the Senate this fall but not considered by the House, sending it back to square one in the next session of Congress.

The High Performance Computing Program was conceived as a five-year, $1.9 billion effort. It is intended to spur the development of a national data superhighway available to millions of government, academic and commercial users. Another goal is to speed the development of ultrafast supercomputers and to beef up training and education in computer science and related disciplines.

Interagency disputes over the network, which nearly killed the bill earlier this year, may resurface. And it is not clear that President Bush wants to hand a public relations coup to Gore, a man known to covet the White House himself. Even so, federal agencies are moving ahead with key portions of the plan by borrowing funds from other programs and getting more funds from Congress through normal appropriations.

"What Gore's doing is clearly in the national interest, and it has the widest possible support," says Eugene Eidenberg, executive vice president at MCI Communications Corp.

• **Computer fraud and abuse.** A bill that would have extended and modernized the 1986 Computer Fraud and Abuse Act was unanimously approved in the Senate but not considered by the House. Sen. Patrick Leahy (D-Vt.), the bill's sponsor, is likely to try again. Among other things, the bill would make it a misdemeanor to "recklessly" transmit destructive software and would provide for the payment of compensatory damages to people suffering losses caused by computer abuse.

Watchers of the Leahy bill say it is the best of a crop that includes some House bills dealing with computer crime.

• **Long-distance deregulation.** A number of telecommunications issues continue to simmer, and some are nearing the boiling point. The matters are complex, but they revolve around two fundamental questions: At what pace should the deregulation of AT&T proceed? What regulatory restrictions ought to apply to Ma Bell's children, the "Baby Bells?"

Tariff 12 allows AT&T to offer discount packages of voice and data services to large customers. Its future is uncertain, however, because of a recent court ruling that questioned its approval by the Federal Communications Commission.

The commission is now expected to draft a new justification, and some Tariff 12-like offerings are likely to remain after a period of customer confusion and delays.

Most observers say they believe FCC Chairman Alfred Sikes will move forward with deregulation in some areas.

The Baby Bells are also yearning to be free. The regional Bell operating companies want to manufacture telecommunications equipment and offer information services, both proscribed by the AT&T divestiture judgment. Legislation is likely to surface to permit entry into the new areas as long as the Bells do it via arm's length subsidiaries.

• **Looser export restrictions?** In 1990, progress was made toward loosening restrictions on the export of computer and telecommunications gear. But confusion remains as to how federal agencies will administer recent guidance from the White House.

Many in the industry say they believe that existing laws and regulations do more to harm U.S. competitiveness than to safeguard national security, particularly with the easing of Cold War tensions. □

Anthes is *Computerworld's* Washington, D.C., correspondent.

Bend me, shape me

What's the best shape for IS in the 1990s? Maybe Silly Putty

BY CLINTON WILDER

With recession upon us, plans to centralize and consolidate information systems operations are in full swing across corporate America. General Electric Co., First Interstate Bank, Avon Products, Inc., Ameritech and Eastman Kodak Co. (in connection with its outsourcing to IBM) are but a few of the Fortune 500 heavyweights in the midst of consolidating data centers.

The breakup of the traditional, centralized glass house over the last two decades was critical to integrating IS with business strategy. Now, however, some companies are finding major cost savings and strategic benefits from recentralizing operations.

"In the 1970s and 1980s, a lot of companies said they wanted to decentralize IS because that made them feel warm and fuzzy," says Dudley Cooke, president of the Executive Insight Group consultancy in Bryn Mawr, Pa. "Now, in a recession, they look around and say, 'Why are we spending so much?' "

Central debate

Yet 1991 may be the year in which the centralized vs. decentralized debate finally ends. A new organizational model is emerging that combines both to be flexible enough to adapt to changing business conditions. Neither a pyramid nor a network, perhaps the best model is Silly Putty.

The new, hybrid structure was the topic last summer in a *Harvard Business Review* article called "The 'Centrally Decentralized' IS Organization," written by Ernest von Simson at The Research Board.

For example, Arco Alaska, the Anchorage, Alaska-based subsidiary of Atlantic Richfield Co., recently created a network services group to centralize management of nearly 26 separate networks that had sprung up in the organization.

"Now all the networks will be managed in the same way, and we won't get 400 solutions to the same problem," explains Jim Porter, manager of administrative and information services.

Fifty-six of the 100 companies in the 1990 *Computerworld Premier 100* say their IS organizations are already a mix of centralized and decentralized functions; no less than 43 have recently merged or consolidated data centers.

Another good example of the new hybrid approach is Stamford, Conn.-based General Signal Corp. Despite its corporate organization as a highly diversified and decentralized manufacturer, General Signal centralized nearly all of the processing for its autonomous business units into two data centers. When recession pressure forced even more cost-cutting last year, it consolidated the two centers.

But what is the proper mix of centralized and decentralized functions? It may be a cliche, analysts say, but the answer depends on the corporation's culture or, more accurately, corporate technology culture.

Phil Marden

"If users have no problem adapting to new technology, then [central control] can be very loose," says John Sifonis, a vice president at Temple, Barker & Sloane, Inc.'s information management systems group in New York. He cites American Express Co. and United Services Automobile Association as heavily technology-oriented companies that have successful IS strategies mainly controlled by business units.

A consensus has emerged that setting technology and architecture standards, approving major purchases and identifying cross-functional systems opportunities are functions that should be managed centrally.

Conversely, there is agreement that business applications development should be in the business units, where IS and line managers can work together in response to customers and markets.

No matter what structure seems appropriate, Cooke says, the most important thing is to continue to be flexible — a practice he calls "rightsizing." The failure of some past organizational models, he states, was the failure of companies using them to stay attuned to changing business times.

More firms are seeing the value of placing IS people in a business unit but having them continue to report centrally to the IS executive. Microage Computer Centers, Inc. in Tempe, Ariz., made that move in late 1990.

"I have some very sophisticated users, and some that are not," says Chief Information Officer Tony Urso. "In the latter case, if I had the person reporting [to the business manager], there is a high probability that he wouldn't be used effectively because the user did not see the need for him in the first place."

That's being neither centralized nor decentralized; that's being flexible — a term that just might become *the* buzzword for IS in the 1990s. □

Wilder is *Computerworld's* senior editor, management.

INTERVIEW

End of IS budgets as we know them?

Forget cost-justifying, says maverick consultant Peter Keen — technology is infrastructure

After IS for competitive advantage and business re-engineering, what's next? The end of IS budgets as we know them, says Peter G.W. Keen, executive director at the International Center for Information Technologies in Washington, D.C. In an interview with Computerworld *Senior Editor Michael L. Sullivan-Trainor, Keen tells managers how to reframe their firms' cost-based approaches to information technology.*

Why can't IS managers successfully cost-justify their companies' investments in information systems?
You can always cost-justify applications, because you've got something to trade off — the benefits of the applications. But the difficulty is that when you're trying to cost-justify or even business-justify the infrastructures that enable those applications, they're all cost and no benefit.

For example, if you're looking at cost-justifying a global network, you can't, because the benefit is in the applications they make possible. But without the network, you can't have the applications. On the other hand, when you build the network, you don't know what the applications are going to be.

What led you to this conclusion?
I went back through previous efforts to look at the business value of big infrastructures. First, I chose the U.S. railroads, because everyone knows they had business value. Even economists can't measure the business value of the railroads. They can look at the business value of the applications — improvements in publication time for newspapers, freshness of vegetables and moving cattle from Chicago to San Francisco.

I then looked at the British industrial revolution and found that you don't get instant benefits from infrastructures. You put the infrastructure in place first. Then there's a long learning process, applications emerge, and some of them work and some don't. Maybe 50 or 100 years later, you know what the overall impact was. So the massive investments of the British industrial revolution don't provide measurable payoff for about 70 to 100 years.

My final example was electricity. When electricity first became commercially available, there were no meters, so companies would contract with a large supplier like Westinghouse Electric or Edison to have a power plant built for them on a fixed cost basis, and they used the lot. When the meter became available, it allowed the creation of things like the Tennesse Valley Authority, many small businesses and home markets.

How do you sort out the business value of the meter vs. the business value of electricity? That's the problem we have in our field. How do you measure the business value of the personal computer vs. the business value of Lotus' 1-2-3 vs. the business value of the network that gets information to 1-2-3 vs. the business value of the information itself?

How can IS solve this?
Investment in information technology looks more and more like research and development, where spending on R&D is a deliberate decision to lower this year's profits because people at the top feel something has to be protected to generate next year's profits or profits 10 years from now.

Coming back to the original question, I don't think it's the job of IS to justify the business value of the applications. That's up to the business units. If they are asking for very scarce capital, they should be accountable for the benefits.

What is the role of IS then?
IS must be much more accountable for its real costs. What I find is that we don't know our costs. As we spend money for development, we're really using development as a loss leader for maintenance and operations. For every MIP of PC power we add outside the data center, we're actually adding about 3.7G bytes of disk storage in the data center. So my rule of thumb is, when we quote the price, it's actually only 20% of the cost.

Besides determining the true cost of systems, how can IS managers change their companies' methods of evaluating expenditures?
They should encourage distribution of responsibility. If we're going to distribute the technology and distribute development, we must distribute business justification. In other words, I think we will see the end of IS budgets, because an application request is a request for capital that will go somewhere else. Now, if the business unit can justify that, then let them take the money away from advertising or hiring or whatever. They must determine whether their investment in IS applications is going to provide a higher rate of return than investment somewhere else.

In distributing the responsibility for costs, where would you choose to draw the line between users and IS?
The IS side looks more like the CFO than anything else. The CFO does not control what people spend their money on. He controls the methodology and standards for spending it. The CFO does not own the calculators people use, but he certainly has massive influence on the financial strategy of the company. IS is moving in that direction.

John Martin

Keen: *Learning lessons from electricity and railroads*

How can IS managers make these changes in the midst of the current cost-cutting atmosphere?
We can show that if you're not growing the IS budget 15% to 20% per year, you're falling behind the business needs. Any fool can cut costs — you just lay people off. We've really got to look at how we can protect the business needs and business efficiency. If we need to go back and ask for more money, we need to do it.

If we get into treating IS as just another cost, going along with the cost-cutting mentality, then in fact, we'll never get back in the game. A lot of the outsourcing is the notion that you can get rid of the cost. Could you imagine anyone outsourcing R&D?

If you're not increasing your IS budget by 15% to 20%, you're falling behind. What is your source for that figure?
That's been the historical rate of overall growth of IS in the economy for 30 years. Every time there is a breakout technology like PCs or office automation or end-user computing, the natural rate of demand growth is about 40%.

Besides, that is the way development compounds maintenance. For every dollar you spend on development, you're going to spend 20 cents on operations and 40 cents on maintenance and enhancement. So if you've committed a dollar of development, you've actually tied up $4 of capital for five years. If you grow the IS budget at 10%, at some point you're going to run out of maintenance or development. It's only in the 15% to 20% range that you can relatively keep them in balance.

If we can't persuade people that the IS infrastructures are in the same category as R&D, then we're going to see the budgets cut again and again and again. The chairman of a pharmaceuticals company said that his job is simple: All he has to do is protect the company's cash flow so it can afford its R&D. That's the attitude you should take to [information technology]. Which part of it is worth protecting the way you protect R&D?

All the things on competitive advantage and business process re-engineering need to feed into that, but they are not the purpose in and of themselves. It should be business process re-engineering so we can streamline our companies to reduce the organizational cost of service.

All of us, when we talked about competitive advantage — we never actually looked at the price tag. So we haven't given a convincing economic model. We get very angry when CEOs keep trying to cut IS costs, and we see that as a failure on their part. But I think it's as much a failure on our part. We haven't given them a convincing reason for them to treat us like R&D. □

OUR 4th ANNUAL DUBIOUS DISTINCTION AWARDS

"Being serious is not a liability when you're talking about computers." — *Buzz Luttrell*
The best of the worst. Compiled by Nell Margolis and Joseph Maglitta. Editorial cartoons by Rich Tennant. Illustrations and design by Tom Monahan.

You bring the zither, I'll bring the crystals

Andersen Consulting created a new management slot for a "Director of New Age and Enterprise Systems."

What are they gonna call 'em? Medium systems?

Psychic prophet Will Loy included in a spate of predictions the news that we will soon be entering "a new age of miracles" that will include "supercomputers that talk to God and communicate with the dead."

Headline from press release dated June 12, 1990

Mips and Daewoo announce broad licensing agreement

Some companies will do anything to make a buck.

At the sign of the golden ballistic arches?

From a press release announcing the promotion of Marketing Director Ken Shrimplin to vice president of sales at Tustin, Calif.-based CMS Enhancements, Inc.: "Mr. Shrimplin . . . has been in the computer industry for 22 years, including positions with McDonald *(sic)* Douglas Corporation . . ."

The 1990 No Bell (And No Whistle, Either) Peace Prize

To Allen Michels and Matthew Saunders III, co-founders of Ardent Computer, Inc. and, later, executives of Stardent Computer, Inc. Within one year of Ardent's "merger of equals" with rival workstation vendor Stellar Computer, Inc., the pair hauled Stardent's Japanese partner and major investor into court. The charges: Conspiring to steal the firm's technology and siphon it off to a Japanese-controlled subsidiary.

Another gem from the folks who brought you the New Age and Enterprise Systems job slot

An Andersen Consulting public relations representative called a reporter to set up a "personal press conference." Asked what such a thing might be, the PR rep replied, "Oh, that's a really just a telephone interview; you know how us marketing people are!"

Headline from a May press release announcing a planned merger between Siemens AG wholly owned subsidiary Dr.-Ing. Rudolf Hell GmbH and Eschborn, Germany-based Linotype AG

Linotype and Hell plan to join forces

Q: When? A: When Linotype freezes over . . .

Headline of another May press release

Errol Flynn accepts leading role at Xircom

But this is only to tide him over until something really tempting opens up at a swashbuckling firm . . .

Hopefully, the software is a little less finicky

As a promotion for one of its software programs, Quarterdeck Office Systems sent its customers and the press wristwatches bearing the message "Building OS/2 power to DOS." But would-be wearers reported that the watches were able to run only when hung on the wall.

Yes, we're positive they weren't party girls

Former Fidelity Investments IS executive Michael Simmons, in a Feb. 8, 1988 profile in *Computerworld*, had harsh words for colleagues who job-hop when the going gets tough. "They're prostitutes," he said. "They don't have to live with the results that they propagate on someone." Since then, Simmons has made two job changes in two years, moving from Fidelity to Bank of America and then to Bank of Boston.

The 1990 Sex Sells Awards

Those were no party girls — those were just job-hopping IS execs

Documents that came to light during a rate case investigation of Nynex Corp. this past summer bared a four-year period during which the firm held week-long annual funfests for employees and suppliers, complete with "women . . . hired to provide entertainment and sex," according to a report in *The Wall Street Journal*.

"People familiar with the Florida meetings say one Nynex employee won the 'Procurement Award' for three consecutive years, apparently for 'arranging for women' for the conventions," the *Journal* said. "Others won the 'Most Valuable Pervert Award' and the 'Moon Over Miami Award.' "

The runner-up

Sys Technology invited attendees to its Comdex/ Fall '90 booth to ogle a scantily clad "Miss Sys" for her "eye-catching debut" in a live aerobics session. Attendees were also invited to be treated to an autographed poster of the sweaty Miss Sys.

Two software developers *check the code and Egyptian Queen Nefertiti looks on as a beta user trains on the new Cartouche interface from TUT Graphics, Inc., promised for commercial delivery as soon as the firm can unearth the user manual*

But can we sit on his lap and play with his little forked tail?

Following the May release on the Linotype and Dr.-Ing. Rudolf Hell proposed merger, Linotype sent out a release noting a press conference that was being held "not only as a show of solidarity on the part of the two companies on this project, but also to give journalists the opportunity to put questions to the Hell management."

Headline and kicker from an October press release

Fujitsu joins forces with Descartes-RAM; VAR[illegible]ement to better serve beverage industry

I drink, therefore I am.

Headline from a March press release

Intex announces 1990 TROLL user group meeting

The constitutional right to free assembly knows no bounds.

Letters we never finished reading

"Dear Editor, Please find enclosed the news release and a few statistics covering our new software package, Drawback-PLUS. . ."

Headline from a November press release datelined San Jose

Thinking Machines and Ultra Network connect with Hippi

Are you sure this wasn't datelined Santa Cruz?

Headline from a May press release

Wall Data offers Rumba software development kit for graphical user interface creation

The original prototype was s Lambada software development kit, but the computer kept blushing and averting its interface.

For those who don't believe in wasting time with middle management

A mail-order software company released an artificially intelligent Biblical research software package called Ask God.

We can at least be grateful that it doesn't come from Groupe Bull

Wayzata Technology, Inc. announced the release of an Apple Macintosh-based compact disc/read-only memory full text called About Cows. Contents include "history, myths, literary references and trivia on America's favorite farm animal, plus color images of various bovine poses."

At least they had easy access to barf bags

Bantam Electronic Publishing planned to show s 90-second tape on the growth of the computer and computer book markets to captive audiences on some 9,000 American Airlines domestic and international flights during the month of November.

Psssstttt, guys: If anybody hands you something called a Mitsumi laptop, quickly run the other way

Japanese computer keyboard maker Mitsumi was referred to in an OEM's press release as "Mitsumi, the world's leading producer of keyboards for the exploding notebook computer market."

Aw, Ma — alphabet soup again?

"HFSI is disappointed in the recent decision by the General Accounting Office to uphold Martin Marietta's protest of the WWMCCS Information System (WIS) Workstation Segment Award to HFSI." (Opening sentence of a May 17 press release sent out by the Senior Counsel of Honeywell Federal Systems, Inc.)

And to add insult to injury, all those folks with emergencies probably never even found out which song won

Ring-in-your-vote phone calls to Finland's annual song contest, broadcast nationwide, blocked vital emergency and service numbers for several hours in October. When the voting lines became busy, callers resorted to nifty redial buttons, which in turn gave out wrong numbers. When automatic dialing took the number halfway, the lines suddenly freed up, so the phone dialed only the last digits of the whole number — which, ironically, coincided with Finland's emergency service code. Only 120,000 of 250,000 calls eventually made it through to the song contest.

Headline from a April press release

A new, two-component polyurethane, reenterable potting/encapsulating compound from Sterling Group

Don't leave home without it.

SHOWTIME

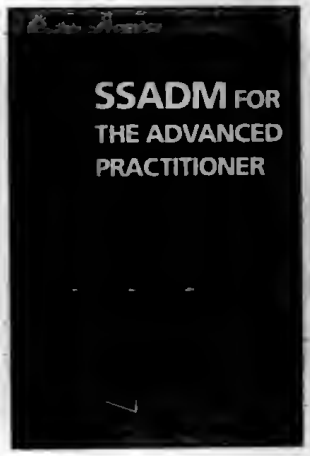
for the ADAPSO Foundation

Roasting John Imlay

"...ROASTED OR SOUTHERN FRIED, D&B'S THE MAIN COURSE!"

Next time, just bring the piranha

A prank by D&B Software CEO John Imlay to bring a tiger to an industry conference ended up backfiring. Imlay had planned to use the tiger — something of an Imlay signature since he featured a big cat in one of his well-known flamboyant company presentations — later that evening at a roast in his honor. Unfortunately, the cat had other ideas and mauled an attendee, though not seriously.



Ahhhhhhhhhhhh — Now we know what he's for . . .

Iraq President Saddam Hussein's August invasion of Kuwait instantly guaranteed the SSADM application design method 1990's Most Unfortunate Name Award.

outlook:
VIEW FROM WALL STREET

Easy Street? Not this year

BY KIM S. NASH

The past year was no day at the beach for computer firms, and industry vendors can probably shelve their Ray-Bans for most of 1991, too.

It's hardly a surprise that technology firms won't be 1991's hottest investment. Recession worries, budget squeezes and diminishing product demand continue to sour Wall Street's outlook.

So the industry is indeed headed for more distress — but how much and how bad?

• **Software shine fading.** Although software is one of the brighter spots in a gray industry, growth is expected to slow in 1991, thanks to a choking national economy.

For personal computer software firms, David Bayer, a senior software analyst at Montgomery Securities in San Francisco, predicts a growth rate of 15%, compared with 30% in 1990. David Wu at S. G. Warburg & Co. is more pessimistic, predicting "nothing above 10%."

Computer-aided software engineering makers, such as Knowledgeware, Inc. and Electronic Data Systems Corp., will probably fare well — thanks to the ever-increasing applications backlog, Bayer notes.

Firms that hop the graphical user interface train should do well, especially if their products work with Microsoft Corp.'s Windows 3.0, says Timothy McCollum, an analyst at Dean Witter Reynolds, Inc. Bayer agrees and especially likes Aldus Corp. and Adobe Systems, Inc.

Analysts concur that

Continued on page 19

A make-good year for vendors

Users will demand more as industry goes from 'tough to tougher'

BY NELL MARGOLIS

If you've been wondering what state the computer industry is likely to find itself in during 1991, the answer is Missouri.

"Show me!" will be the slogan of users from coast to coast — and "ex" the word for vendors who don't, won't or can't.

Until recently, users were willing to overlook a lot — if products and services were reasonably on-time and on-target. Now, however, many users — stung by negative experiences — are entering the new year with eyes painfully open to the importance of losses, layoffs and corporate reorganizations.

"Suddenly, users are afraid of [supplier] companies actually leaving the business," says Norman Weizer, computer industry analyst at Cambridge, Mass.-based management consulting firm Arthur D. Little, Inc.

With intensified user scrutiny and stiffer competition for shrinking customer dollars, life in the computer industry is "going to go from tough to tougher" in 1991, says David Wu, an

Continued on page 19

Debbie Palen

A recession by any other name . . .

President Bush called it "a slowdown." His chief economic adviser, Michael Boskin, termed it a "lull." Federal Reserve System Chairman Alan Greenspan called it "a meaningful downturn."

After months of semantic pussyfooting, it's time to call a fade a fade. Something bad is upon us, and it smells a lot like a recession.

That observation is not likely to shock information systems managers, who have been penny-pinching for many months and, in some cases, years.

Nor is it news to computer industry vendors and service providers, who have been bleeding heavily — even without the benefit of an official acknowledgment of the downturn.

OK. Everyone knows things are bad, especially in the Northeast and in the airline and banking industries, among others. But how bad will they get? For how long?

Wearied by a lengthy "pre-cession" and official obfuscation, *Computerworld* asked several top economists to illuminate what is really going on. Our "Recession Scorecard" is not infallible, but at least it's straight talk. □

JOSEPH MAGLITTA

Recession Scorecard

Roger E. Brinner *DRI/McGraw-Hill*	Yes. Started last October	Mild recession lasting three quarters, out by summer '91	Iraq's invasion of Kuwait	1Q: -2.1% 2Q: -0.4% 3Q: 2.8%	Will peak at 6.8% in third quarter of 1991
Stephen Roach *Morgan, Stanley & Co.*	Yes.	Mild and short, out by summer '91	Primarily oil shock and banking crisis	1Q: -1.5% 2Q: -1% 3Q: 3%	Will peak at 6.5% in third quarter of 1991
			NA.		

C.W. Research: Kevin Burden

Make-good

FROM PAGE 18

analyst at S. G. Warburg & Co.

How can computer firms cope in this harsher climate?

In its 1990 "Report on the Computer Industry," management consulting firm McKinsey & Co. isolated six roles that it believes will be available to computer firms in the foreseeable future (see story this page).

Classic hits

Some of the same old vendors' songs will be rereleased in 1991, louder than before. Likely chart-toppers: "We Are an Open Systems Company;" "No Matter What You Think We Are, We Are a Software Company;" and the perpetual No. 1 hit, "We Are a Service Company."

In 1991, however, singers had better do more than just mouth the words. Any promising strategies that failed to deliver will fall from grace in 1991, according to analysts. Several approaches likely to fade are:

• **Mergermania.** "The history of the computer industry shows that acquisitions generally don't work," notes Labe, Simpson, Inc. analyst Peter Labe. Rarely, if ever, do such unions work as quickly or as completely as the parties privately hope or publicly promise. Although AT&T is seemingly bucking this trend by taking aim at NCR Corp., that action is basically an anomaly, observers say.

• **Imported strategies.** While it's always smart to pick up pointers from your competitors, Weizer says, what works in one culture doesn't always work in another. Vendor companies, he cautions, must be "very careful about what they try to adopt."

• **Reliance on overseas earnings to brighten dismal bottom lines.** Economic sluggishness isn't an ill that's confined to the U.S. "International business in the coming quarters will be much slower than people think," Wu says. "Companies betting on international to bail them out are going to be disappointed."

What *should* companies bet on? The smart ones, analysts say, might tag 1991 as the Year Accountants Gained Respect. Poor accounting practices, along with inept pricing policies, are largely responsible for the binds computer companies find themselves in now, Paine Webber, Inc. analyst Robert Therrien says.

"For the first time, perhaps, in computer industry history," says analyst Byron Walker at Moody's Investors Services, Inc., "companies are going to have to start paying attention to their balance sheets instead of to their quarterly bottom lines." □

Margolis is *Computerworld's* senior editor, industry.

What part will they play in 1991?

BY NELL MARGOLIS

In 1991, computer industry vendors will try to position themselves in one of six key roles, according to management consulting company McKinsey & Co.

• **Broad-based market leader.** This means a firm that offers basically everything to everyone. It's an attractive idea, but as McKinsey notes, the resources required to play and the whopping revenue required to grow limit this option to a very small group. Realistically, one analyst says, it could limit it to IBM.

• **Leadership platform supplier.** This role, McKinsey says, falls to the firm that "continually breaks new ground by virtue of its technology." Membership requires hefty research and development investment, which probably means little leeway in other spending areas.

Leadership platform suppliers need partners early and often — third parties to build on the leadership platforms, as well as OEMs and resellers. Sun, anyone? Tandem Computers, Inc. and Stratus Computer, Inc. could both fit here — assuming they don't go for Hot Box/Niche Supplier. Apple used to be in this category. In 1991, the world will be watching to see if it stays in the running.

• **Hot box/niche supplier.** Firms that target a highly tailored product for the needs of a given market apply here. "In one or more ways," McKinsey explains, the hot box/niche supplier "does one better over existing competitors and generally tends toward faster, cheaper equipment."

If Sun Microsystems, Inc. is any example, other analysts note, expect to see some companies segue from this role to that of leadership platform supplier. Current inhabitants of this niche include high-end scientific and technical graphics suppliers, disk-drive players and video-teleconferencing firms.

This is also a likely harbor for former broad-based market leaders. Watch for Prime Computer, Inc. and Wang Laboratories, Inc. to try to sail into this harbor in computer-aided design and manufacturing and imaging, respectively.

• **Geographic marketer.** This is defined by McKinsey as "a company that concentrates its sales efforts in a specific geographic region or regions." Also emphasized: customer relationships and support capabilities.

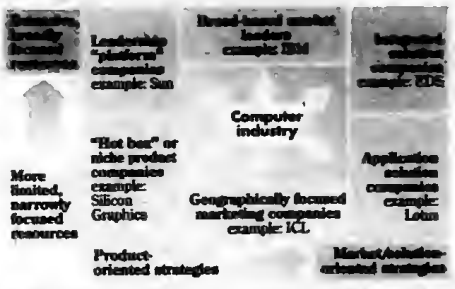
Take, for instance, a joint venture that was announced in November by New Jersey-based Software Plus, Inc. and Illinois-based System Software Associates, Inc., two software companies catering to the IBM Application System/400 user base. The venture shows that McKinsey is on the mark.

• **Application solution provider.** A good example here is Ross Systems, Inc. The privately held Redwood City, Calif.-based firm took a long, hard look at the weak market and economy and then decided to stick with the Digital Equipment Corp.-based financial application products that have kept it glowing while greedier neighbors have flashed and burned.

• **Integrated solution provider.** Included in this category are systems integrators and outsourcing vendors — Andersen Consulting and companies such as Legent, Inc. and Computer Associates International, Inc. — which offer soup-to-nuts software and services to data centers. One drawback to this role, McKinsey notes, is "competition from all directions, including partners." □

Spread out

Computer vendors increasingly fall into one of six corners within the industry



Source: McKinsey & Co. CW Chart: Marie Raines

Easy street

CONTINUED FROM PAGE 18

Microsoft is the single standout in the software industry. With booming sales of Windows 3.0, Bayer pegs Microsoft's revenue for fiscal 1991 at $1.64 billion.

On the down side, analysts predict that Oracle Systems Corp., Computer Associates International, Inc. and other makers of software for large systems will continue their long, slow slides.

• **Skinny minis, mediocre mainframes.** More diets are on the plate for minicomputer firms. Mini makers must continue to slim down if they are going to make any money from open systems, says Laura Conigliaro, an analyst at Prudential-Bache Securities, Inc. The transition won't be speedy or smooth, she cautions, and will continue to erode growth rates.

Digital Equipment Corp. is still in transition from a proprietary midrange line to a mix of open minicomputers and mainframe-class systems and is not expected to grow at all, according to Wu. Even among healthier large systems vendors, including Amdahl Corp., IBM and Cray Research, Inc., Wu predicts growth will be no better than 5%.

As for firms with big money problems — Unisys Corp., Data General Corp. and Wang Laboratories, Inc., among others — analysts see more lean times. "If 1991 is going to be worse for everybody, then these companies have an even greater challenge — and that's some understatement," Wu says.

• **Semiconductors: semisuccessful.** Chips are expected to be a fairly bright spot, especially those supplied to high-performance desktop systems. The big reason, says William Tai, an analyst at Alex. Brown & Sons, Inc., is the continued growth of the PC market.

Intel Corp. grew approximately 150% in 1990, reflecting its virtual lock on the IBM Personal Computer and compatible market — a situation unlikely to change in 1991.

Chip makers supplying mainframe and minicomputer manufacturers will do poorly, analysts say, because of continued slow demand for those machines. National Semiconductor, Inc., Advanced Micro Devices, Inc. (AMD) and Texas Instruments, Inc. are expected to grow between just 20% and 30%.

AMD has a slim shot at bottom-line improvement with a clone of Intel's 80386, but that would be the turnaround story of the year, Tai says.

Small companies that make Scalable Processor Architecture chips for workstation vendors, such as Sun Microsystems, Inc. and Tatung Science & Technology, Inc., could blossom in 1991. Watch Cypress Semiconductor and LSI Logic Corp.

Apple Computer, Inc.'s recent price cuts on its Macintosh line may foster sales for VLSI Technologies, Inc., which supplies processors used in the Macintosh. Both companies may benefit further from a recent joint venture to make reduced instruction set computing chips in England.

• **Mac to attack, but Compaq on track.** New products announced in late 1990 could help Apple. But analysts say Apple also needs to plug holes in its product line if it really wants to bite into the IBM Personal Computer and compatible pie. Apple must address its lack of a 386SX-class machine and a competitively priced portable, which the company says it plans to do next year, Wu says.

Analysts predict that high-end systems and clones will do best this year. □

Nash is a *Computerworld* researcher, features.

Seven changing companies looking for a lucky year

A new, open IBM keeps heavy cargo rolling out

BY MARYFRAN JOHNSON

IBM will be talking a Big Blue streak about open systems, software and services in 1991, as the industry giant buckles up for a rough economic ride with a trainload of new products and technologies in tow.

"Many of the cards IBM will be playing out in 1991 are, in the technological sense, on the table right now," says Robert Djurdjevic, president of Annex Research in Phoenix.

The aces in that deck are the Enterprise System/9000s, announced last September as the follow-on generation to the 3090 mainframes and older 4381 and 9370 midrange lines. Volume shipments of the new systems are scheduled to begin in 1991, and analysts are already crediting IBM with a smooth transition from the System/370 line to the System/390 "Summit" family.

Aside from delivering on Summit, IBM will continue to expand its Unix-based RISC System/6000 workstation and server line and the Personal System/2 family. New high-end Application System/400 minicomputers, with long-awaited multiprocessor capabilities, will be announced before mid-year 1991, analysts say.

At IBM's late summer AS/400 announcement, it announced the "opening up" of the OS/400 operating system to customers and third-party programmers who need to customize it for their own purposes.

"We are investing a lot of marketing energy into becoming a premier service and software provider," says William Grabe, IBM vice president and general manager of U.S. marketing and services.

"IBM's got a pretty admirable bag of goods to peddle next year," agrees Peter Burris, an analyst at International Data Corp. in Framingham, Mass. "But the No. 1 priority will be ensuring the sales force really understands how to position and sell those products. Issue No. 2 will be figuring out what IBM's open systems strategy is and communicating that to customers."

Like every other vendor on the planet, IBM is swearing fealty to standards-based, multivendor computing. "We are totally committed to open systems," Grabe says.

IBM
Armonk, N.Y.

CEO: John Akers

- **Biggest challenge:** Lock in gains from Summit and other rollouts; continue toward standards-based computing
- **Strategy:** Solidify interest in newest products, particularly among System/370 users

Customers can expect to see IBM pushing a wide array of new software products — many of them from third-party vendors — that give users the ability to access data and systems anywhere in the enterprise, Grabe adds.

He also promises "significant improvements" in 1991 that will permit easier interoperation with systems made by Apple Computer, Inc., Digital Equipment Corp., Sun Microsystems, Inc. and others.

On the software front, the biggest news this year will be shipments of Version 4 of IBM's MVS mainframe operating system and long anticipated releases of VM/ESA and VSE/ESA.

On Wall Street, IBM has been generating optimism lately as well. They note approvingly how IBM has consolidated operations and cut its work force by 8% since 1986. They credit IBM Chairman John Akers with streamlining operations through the elimination of thousands of overhead positions and the retraining of at least 65,000 employees for revenue-generating jobs in software, sales and services.

"I think IBM will continue to cut, and they are building a very cautious operating expense plan for 1991," says John Jones, a financial analyst at Montgomery Securities in San Francisco. "If there is a severe recession, however, IBM will get hurt like every other big firm." □

Johnson is a *Computerworld* senior editor, systems and software.

Firm makes its name, and that's no Bull

BY SALLY CUSACK

Motorists have grown accustomed to the brash slogans screaming down from billboards, and television viewers have become familiar with the message flashing brightly across the screen — *Globull. Knowledgeabull. Expandabull. Reliabull.*

The blitz has caused some to wish openly that the splashy advertising campaign would become *Invisibull.* No chance.

Having established name recognition, Bull HN Information Systems, Inc., the U.S. arm of international corporation Groupe Bull, now plans to present the public with tangible proof that a new company *does* indeed exist in the old Honeywell buildings in Billerica, Mass.

Roland Pampel, president and chief executive officer of Bull HN, says the company plans to aggressively enter several new areas in 1991. Among them, he says, are commercial software applications, especially in the public services sector, and computer-aided software engineering, with a product to be introduced early in the new year.

Pampel also says he sees terrific opportunities for Bull HN in the global marketplace. He cites a recent agreement with Lucky Goldstar, the Korean manufacturing group, as one way of "aggressively attacking the Pacific Rim."

John Dunkle, vice president at Workgroup Technologies, Inc. in Hampton, N.H., says he believes Bull HN will survive the switch from being a proprietary hardware firm to a broad-based services provider and systems integrator if it can establish an identity firms in Fortune 500.

"They have the technology," Dunkle says. "It's more a matter of marketing."

Bull hopes to especially distinguish itself in niche markets. A good example is its Unix-based workstation system that was developed to assist social workers in child abuse prevention. The company also offers several other Unix-based local-area networking products aimed at legal firms and law enforcement agencies.

Bull
Bull HN Information Systems, Inc.
Billerica, Mass.

CEO:
Roland Pampel

Biggest challenge:
Switch from proprietary hardware to broad-based services

Strategy:
Offer products in several areas, including public sector software and CASE

Marina Young, president and CEO at Information Strategies Group, a market research firm in Washington, D.C., says that Bull HN is definitely moving its focus away from big iron technology and turning toward applications.

"Bull [HN] is positioning itself as a premier systems integrator," Young says. "It is saying, 'Tell us what you want, and we'll tell you how to get there.' "

Bull HN has stepped up its efforts to wed its proprietary GCOS operating system to the world of AT&T Unix System V-based systems and has backed those efforts up with a $2 billion commitment to research and development.

According to Steve Josselyn, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm, Bull HN's strategy is attainable and makes sense. But, he says, the question remains: Does Bull HN have the staying power it needs to realize these goals?

"[Bull] has to unify its existing architectures, while simultaneously downsizing the organization to accommodate the lower Unix market margins," Josselyn says.

Downsizing has been highly visible this past year, as Bull HN reduced its U.S. work force by 800. Layoffs will continue through December 1991, with large cuts targeted for its Billerica headquarters and facilities in Arizona. The firm lost $511 million in 1990.

But as the old company is swept out, the new company is sweeping in new business opportunities to better position itself for the changes of the 1990s.

"Bull [HN] has made some shrewd acquisitions in the past few years," Young says, referring to the purchase of Zenith Data Systems and Honeywell Federal Systems.

Steve Gardner, vice president of U.S. marketing at Bull HN, emphatically states that the message will change from "Knowbull" to "Knowbull for Something" in 1991. □

Cusack is a *Computerworld* staff writer.

Cash-strapped Unisys unifies products

BY ELLIS BOOKER

Gamely putting the best face on things, Unisys Corp.'s media department has spent the past months blitzing the industry with news: new products, new customers and new installations of Unisys systems at sites both large and small.

The campaign has not, however, hidden the obvious from either Wall Street analysts or customers. Unisys, the nation's third largest computer firm, is starting 1991 in serious financial trouble.

Unruh: *We are not in a crisis situation*

The investment community is awash with speculation about what assets the $10 billion computer and defense company intends to sell to meet its short-term debt obligations. All told, Unisys carries $4 billion in debt.

Company officials maintain they are not facing a liquidity crisis and point repeatedly to a $1.25 billion revolving credit line arranged for the company by a consortium of 20 banks. The credit is good through January 1993.

But this reserve does not comfort some analysts. "They're $250 million away from breaking a net-worth test," said David Schofield, a technology analyst at Duff & Phelps Investment Research Co. in Chicago. Should Unisys have a few more bad quarters with losses of $100 million or more, Schofield says, bankers could demand more control of the company or even "walk out on the revolver . . . and that would force [Unisys] into bankruptcy."

At the same time, other analysts paint a scenario in which a weakened Unisys is acquired, possibly by a Japanese or European company.

Among the more interesting of these hypothetical marriages involves Japan's Mitsui & Co., the Japanese trading entity (*keiretsu*) that includes Toshiba Corp., which might find some synergy with Unisys' workstation and Unix-based processor business.

Earlier this year, Mitsui acquired $150 million of Unisys' stock, and the firm already has a joint relationship with Unisys in the form of Nippon Unisys, in which both companies hold a 30% stake. However, a Japanese or European suitor is unrealistic unless Unisys divests itself of its defense businesses, these observers point out. In fact, the defense business is reportedly one of the assets Unisys has put up for sale.

Unfortunately, the clamor over finances has obscured Unisys' recent earnest efforts to rationalize its disparate product lines.

Formed in 1986 with the merger of Burroughs Corp. and Sperry Corp., Unisys became the country's third largest computer concern — but at a price. The company inherited incompatible computer architectures from its two parents.

Further complicating the picture, Unisys acquired Convergent Technologies, Inc. in 1988, picking up the San Jose, Calif.-based vendor's line of networked workstations. Factor in Unisys' own Unix line, represented by the U series, and its Timeplex, Inc. data communications subsidiary, and the complexity of the company's product picture is apparent.

In September, the firm unveiled a plan for wrapping its proprietary mainframes with client/server and open systems software approaches as the "glue" to attach these "information hubs" to each other and to hardware from other vendors.

Key will be the late first-quarter delivery of a "single environment that allows customers to use [our fourth-generation languages] in integrated fashion," says Jim Murtaugh, vice president and general manager of Unisys' Information Networking Group.

The coming year will also see Unisys delivering more components of its distributed, cooperative architecture. The plan for 1991 calls for mixing open, proprietary and de facto standards to unite Unisys' and other vendors' systems.

Customers, while generally calm, also admit to worrying about the company's long-term health. Some say they are investigating alternatives.

"In the short term, we're not concerned," says Michael Niestemski, business unit manager of aircraft build systems at Douglas Aircraft, a McDonnell Douglas Corp. unit. "But we are looking at things that might get us off the Unisys platform four or five years down the road."

But other users, citing Unisys' size and installed base, find little reason for alarm. "I don't see [the company] disappearing," declares Thomas F. Malanga, manager of information systems technical support for Sunshine Biscuits, Inc. in Woodbridge, N.J.

The company's current fiscal cloud shows no sign of lifting. A worse-than-expected $356.8 million loss in the third quarter and the likelihood of a loss in the fourth quarter battered Unisys stock, which absorbed a yearly low of 1¾, down from a 12-month high of 17⅛. □

UNISYS

Unisys Corp.
Blue Bell, Pa.

• • • • •

CEO: James Unruh

Biggest challenge: Convince financial markets that massive debt burden does not threaten existence

Strategy: Integrate acquired product lines; sell software to knit them together

Booker is *Computerworld's* Chicago bureau chief.

Wang continues its long, uphill march back to profitability

BY SALLY CUSACK

When An Wang, an inventor, entrepreneur and philanthropist, died last March after a long bout with cancer, Wang Laboratories, Inc. Chief Executive Officer Richard W. Miller said the late chairman and founder "believed in and supported our plan to restore Wang Laboratories to profitability and industry leadership. Now it is up to us to finish the job."

Analysts agree that to "finish the job," Wang must make 1991 the year that it delivers on its promises to bring more open architecture products to the market. The hopes at the Lowell, Mass.-based company are high.

"Now that we've stabilized the financial condition of the company and strengthened our management team, the key will be a successful rollout of a full line of products capable of operating in a multivendor enviroment," Miller says.

Roger Sullivan, vice president of BIS CAP International, Inc. in Norwell, Mass., says Miller isn't just dreaming. "Wang is correctly de-emphasizing the importance of the proprietary VS mini and is repositioning it as a server to complement their strong imaging products," Sullivan says.

The company is also emphasizing customer applications, which requires a shift in company mind-set from minicomputer maker to a full-service, open systems vendor specializing in imaging and applications software, Sullivan says.

According to Barbara Babcock, vice president at Gartner Group, Inc., a Stamford, Conn.-based research firm, Wang has defined a strong, dual-focus strategy for 1991.

"They have a niche strategy of document imaging and a management strategy in targeted markets," Babcock says, referring to Wang's increasing presence in the legal, banking, insurance and medical fields.

Miller confirms the observation. "We're going to rely on our core technical strengths, combined with our newer imaging strengths, to move from the office automation to business processing automation environments," he says.

Miller was presented with no easy task in August 1989, when he accepted An Wang's invitation to take over the helm at Wang.

Arriving at the lowest point in Wang's history, Miller found a company deeply in debt and riddled with warring internal factions. Long-neglected customers angrily criticized Wang products and services.

But, Babcock says, "Miller is not afraid to shoot sacred cows and change the teams. It's remarkable what the company has achieved under him in 15 months."

Wang can look back at 1990 with some pride. It has paid off $575 million worth of bank debt, reduced operating expenses by $400 million annually and trimmed its work force by 3,900. Wang has also regained the confidence and support of its customer base — primarily through Miller's outreach program, Operation Customer — and has scored some large contracts with the federal government, Mellon Bank Corp. and ITT Hartford Insurance Group.

The good news in 1991, Sullivan says, is that Wang has gone through the necessary downsizings with which other companies are just beginning to deal. The bad news is that the U.S. is in a recession, and resistance to the new approach still lingers in some quarters at Wang.

Even though the entire organization is going through a "total commitment to quality training process," Sullivan says, Wang still must become more "field-focused" as opposed to "home-office-focused."

Wang is still dealing with poor public image. Despite a net profit of $2.6 million in the first fiscal quarter of 1991 — compared with a net loss of $62.1 million in 1990's first quarter — some customers and potential buyers are saying "wait and see."

The trick, Sullivan says, is to hold to the economic plan. A strong second quarter will show good progress, he says, and would "bode good news indeed" for Miller's dream of returning to profitability. □

WANG

Wang Laboratories, Inc.
Lowell, Mass.

CEO: Richard Miller

- **Biggest challenge:** Continue rebuilding customer and market confidence after recent setbacks
- **Strategy:** Concentrate move away from proprietary systems and toward imaging and applications software

Oracle slims down, branches out for a tough year ahead

BY JEAN S. BOZMAN

Oracle Systems Corp. is pulling itself together and preparing for highly competitive days ahead in 1991. Major changes in management, support and product development have taken place in recent months, following an autumn layoff of more than 500 people at the $971 million software firm.

The heady days of doubling revenue each year — as Oracle had done for 10 years — are gone.

"They're going to have to get into shape, financially and in terms of customer support, and that'a a healthy thing," says Dale Lowery, president of the East Coast Oracle User Group.

The firm's financial troubles, which started last April and continued until the Sept. 25 announcement of a $36 million fourth-quarter loss, have been deep.

Wooing large customer sites will be key to Oracle's success in 1991, says Geoff Squire, executive vice president in charge of Oracle's worldwide sales organization. "Customers and business partners alike have been very understanding in recent months," he adds.

The shock waves from 1990 are still booming through Oracle. Since September, users say they have begun to notice improvements in customer support — something Oracle user groups had been demanding.

In recent months, Squire and Oracle USA President Michael Fields have toured customer sites around the world to make sure Oracle is listening to users' complaints and responding to them. Some Oracle employees are even being assigned to work at very large customer sites.

New products coming

To prosper against tough competitors like Sybase, Inc. and Ask Computer Systems, Inc., analysts say Oracle must add new layered software products on its core relational database management system (RDBMS). It has begun to do so with its computer-aided software engineering (CASE) tools and its applications for manufacturing and financial uses.

To build its new generation of product offerings, Oracle is working with outside vendors, including Hewlett-Packard Co. and Tandem Computers, Inc.

Oracle executives say many new offerings are being readied, including database, networking, and CASE tools and applications software for human resources and finance.

ORACLE

Oracle Systems Corp.
Redwood City, Calif.

• • • • •

CEO: Larry Ellison

Biggest challenge: Shrug off effects of major losses; broaden base past core RDBMS product

Strategy: Keep in touch with customers; move into CASE and other areas

But Oracle'a main product debut for 1991 may be Version 7.0, an upgrade to Oracle's Version 6.0 RDBMS. The update is said to deliver new functionality, including two-phase commit for distributed transactions, database administration tools and new referential integrity features.

Selling such a wide array of products will be a big challenge. In September, Squire, who was previously president of Oracle's European sales division, was promoted to oversee all Oracle sales worldwide. The promotion came amid the departures of many top sales executives. Now, Squire and Chief Financial Officer Jeff Walker, both of whom report to Chief Executive Officer Larry Ellison, appear to be running the firm with Fields.

Oracle expects to see 25% revenue growth in 1991, Squire says, with the highest growth rates stemming from Europe and the Pacific.

Industry analysts are cautious, however. "The question is how much they've stolen from the future [business] to achieve their past results," says David Bayer, a senior software analyst at Montgomery Securities in San Francisco. "They're certainly not out of the woods." □

Bozman is *Computerworld's* West Coast senior editor.

Can new Macs restore shine to Apple's future?

BY JAMES DALY

Nearly seven years after cofounders Steve Jobs and Steve Wozniak dazzled the world with the Macintosh personal computer, $5.56 billion Apple Computer, Inc. doesn't look so shiny.

Many observers link the woes to poor strategic planning, an overpriced, laggard product line and management turmoil. Also, Apple'a once-snappy trademark icons and pull-down menus are now commonplace in the IBM world.

"Apple is about two years behind the curve in many of the things it does these days, and that's starting to hurt them," says Jim Poyner, an analyst at research firm William K. Woodruff & Co. in Dallas.

Fortunately for Apple, insiders say major changes are afoot. Chief Executive Officer John Sculley has promised "there will be no sacred cows" as the company realigns. And the October introduction of three low-cost machines — the Macintosh Classic, Macintosh LC and Macintosh IISI — sounded the death knell for expensive Apple products.

Critics say the cheaper products are a much-needed first step that will help the Cupertino, Calif., firm adjust to today's market.

During the 1980s, the success of the Macintosh helped Apple become financially solid. Unfortunately, while it was getting rich, the firm's corporate vision became blurry, watchers say.

"Apple's present mentality is a holdover from the era of Steven Jobs, who articulated the company'a mission as 'building great computers' and 'changing the world,' " says Michael Ryall, s partner at Decision Strategies International, a consulting firm in Morristown, N.J. "But this vision is too vague to provide powerful guidance in the 1990s. It doesn't give the organization s clear road map." The result: Apple'a share of the $42.3 billion domestic PC market has plummeted from about 15% only a few years ago to about 10% today, according to Dataquest, Inc., a San Jose, Calif., computer industry researcher.

Sculley *promises "there will be no sacred cows"*

During the same period, earnings hit the slow track; net revenue for the fiscal year ended Sept. 30 inched up only 5% from the year before. Compared with one year earlier, fourth-quarter profits plummeted 39% to $98.5 million.

Observers say the new low-cost Macintoshes, especially the Classic, offer Apple new hope. Paul Norris, an analyst at Gartner Group, Inc., s research firm in Stamford, Conn., estimates that 1 million Classic sales are possible within the next year.

The company also plans to continue an aggressive rollout schedule in 1991. Awaiting release is a cheaper and lighter (8 pounds) portable computer based on the Motorola, Inc. 68030 chip. Also planned is s high-end, 68040-based Macintosh and a new version of its opersting system, System 7, that will include several communications and memory features not expected to appear on PCs for several years. There may even be a Macintosh based on reduced instruction set computing technology.

Analysts say the new lineup will help Apple better compete against powerful, low-cost IBM Personal Computer clones.

With the product momentum in full swing, Apple USA President Robert Puette says the company must now develop more effective distribution channels. Apple has long needed to patch up relations with dealers, who resent it selling directly to large customers. "We need to beef up the retail channel," Puette says. "We need to serve s wide variety of environments."

Plans include reviving slipping sales to schools and colleges, phasing out its "major accounts" sales force and turning corporate sales over to local dealers.

Apple is also planning to use leading systems integrators, such as Electronic Data Systems Corp. and Arthur Andersen & Co., and has invested cash in Exis, an independent Peat, Marwick, Main & Co. unit.

Industry analysts say all of these moves are needed to satisfy sophisticated corporate users and could help Apple ink the major business contracts that have forever seemed beyond its grasp.

Man on the spot

The task will fall to Morris Taradalsky, Apple'a vice president of customer service and information technology. "For years, Apple was viewed as a company that simply did not understand the corporate world," Taradalsky says. "But with new products like our high-end Mac FX, that is changing."

Introduced in March, the FX is Apple's most workstation-like product yet, offering a 40-MHz Motorola 68030 computational engine.

Apple will also reportedly work with Japanese giants Sony Corp. and Toshiba Corp. to develop and manufacture its next-generation Macintosh laptop. The move would link Apple with experienced players in a hot market where it has so far only stubbed its toe.

"Apple is a strong firm with good products," says David Brown, an analyst at International Data Corp. in Framingham, Mass. "It dared to be different and won, and there is still plenty of opportunity left." □

Daly is a *Computerworld* West Coast senior correspondent.

Apple Computer, Inc.
Cupertino, Calif.

CEO: John Sculley

- **Biggest challenge:** Improve standing in the corporate desktop market; stave off Microsoft Windows 3.0
- **Strategy:** Concentrate on new low-cost offerings of flagship Macintosh line

Changing of guard, sharper customer focus in store at HP

BY J.A. SAVAGE

Observing Hewlett-Packard Co. management is often like watching poker dealers in Las Vegas. Shuffle. Lay down cards. Shuffle again. Though the company denies it, one thing HP's observers can count on in 1991 is more shuffling of the company's management and divisions.

"My crystal ball is clear enough that I can see additional changes at the top," says Michael Goulde, vice president of Open Systems Advisors, Inc., a consulting group in Boston. He predicts more focus on customers and marketing, led by top-level executives who can bring about needed changes.

Company watchers say other changes at HP are on the horizon in 1991, including a furthering of the open systems stance, faster systems based on symmetric multiprocessing and the promise of jazzier marketing. The company also says it plans to spend more on sales, training and advertising.

While 1990 revenue was up 11% to $13.2 billion, net earnings were down by the same amount. Net earnings per share were off by 13%. Over the year, however, quarterly revenue growth dipped from 17% (compared with the first quarter of 1989) to only 6% in the final quarter.

Late in 1990, HP reorganized its top management — including the chief executive position — for the fourth time in three years. The reason, according to analysts, was to improve decision-making and coordination between product groups.

Despite predictions of another big shake-up, HP says it won't make any more high-level changes. Dick Watts, manager of sales and distribution for HP computer products, says he does, however, expect ripple effects to be felt through the organization during the year.

Late in December, HP restructured its computer division, merging four groups into the new Networked Systems and Cooperative Computing Groups. According to Lewis E. Platt, head of Computer Systems, the simplified structure will help HP get products to market more quickly.

HP Chief Executive Officer John Young, who now shares the office with Chief Operating Officer Dean Morton, is expected to stay in his job at least through 1991, according to analysts.

In the coming year, the company will continue on its open systems crusade, which some analysts consider a risky strategy in the short term.

For instance, HP is considering full support of open systems — that is, being an integrator and hand-holder without regard to vendor hardware. This is a service users migrating in that direction are in dire need of, but one that is still an iffy proposition, according to Goulde.

"The people responsible for customer support on a worldwide basis are figuring out how far they can go," Goulde says. "Can HP support five platforms and 500 applications? Will it get cooperation from other vendors?"

Because of its faith in open systems, HP is better positioned than other companies to become an open systems vendor, says Carolyn Griffin, an analyst at International Data Corp. in Framingham, Mass.

HEWLETT PACKARD

Hewlett-Packard Co.
Palo Alto, Calif.

• • • • •

CEO:
John Young

Biggest challenge:
Settle management situation; concentrate on move to open systems

Strategy:
Hold current management lineup steady; put zip into marketing efforts

HP has thrown its weight in with the Open Systems Foundation. In 1991, the company will offer the first version of OSF's Unix operating system, OSF/1, on its reduced instruction set computing (RISC) workstations and workstations based on the Motorola, Inc. 68040 processor.

Some users are wary. John Robinson, director of corporate information systems at Cox Enterprises, Inc. in Atlanta, fears HP's charge into the open systems business would force the company to lose focus on its own products. "I don't see how it could succeed in selling everyone's products," he says.

"They're not a strong marketing company," Robinson notes.

Other problems loom. HP's software strategy, New Wave Computing, invites confusion. New Wave is a host of products designed to facilitate networking, use idle CPU power and integrate multimedia. New Wave is also the name of a personal computer-based application that runs on top of MS-DOS Windows, with added features. "Clearing up that confusion is on their agenda," Goulde says.

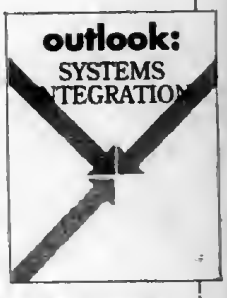
On the hardware side, HP will roll out two new pieces of technology this year: symmetric multiprocessing for its Unix systems (Series 9000 Model 870/200 and 870/300), due in midyear, and a faster single processor.

The company has announced work on multiprocessing and also aims to juice up the power of its RISC processor, with products with CPUs between 60 MHz and 90 MHz expected in 1991. □

Savage is a *Computerworld* West Coast senior correspondent.

Do it your way, but quickly

BY LORY ZOTTOLA



The watchwords for integration in 1991 will be fast turnaround, targeted solutions and business-boosting results — especially when it comes to dealing with commercial systems integrators.

The following are some of the big integration issues that information systems managers will face in the coming year:

• **Do it yourself.** The majority of organizations will continue to handle large integration projects in-house. According to a study by The Ledgeway Group in Lexington, Mass., most IS managers are unwilling to use outside providers in such areas as change management, strategic planning and needs assessment.

Why? Among other reasons, analysts say, using a commercial integrator might be seen as a sign of internal IS weakness. More importantly, the commercial systems integration market is still unproven. "Because it's an immature market, it's taking users longer to get comfortable with what systems integration can do," says Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn.

As the 1990s unfold, however, that may change. The market for commercial systems integration is expected to grow 24% annually for the next few years, according to Douglas Wilder, manager of the systems integration program at Input, a research firm in Vienna, Va.

• **Fast is in.** Tougher economic times have focused IS managers on projects with short-term return on investments. For many, five- and 10-year projects are out. As a result, analysts expect great demand for professional services, such as outsourcing. This arrangement, Digrius explains, lets IS managers parcel out portions of their data centers or networks to cut costs while keeping strategic projects in-house.

• **Let's get vertical.** To make themselves more attractive to commercial customers, systems integrators will take a vertical bent in '91. Integration stalwarts such as Andersen Consulting, Electronic Data Systems Corp., IBM, Perot Systems Corp. and Logica PLC, among others, have reorganized or realigned themselves to zero in on vertical markets.

Wilder says hot IS areas for systems integrators in '91 include discrete manufacturing and state and local government.

• **Swing your partner, do-si-do.** Systems integrator alliances will continue at a head-spinning pace next year. Vendors will form ties or buy companies to get instant expertise in commercial areas in which they have limited presence.

For example, Andersen Consulting and Pyramid Technology Corp. are pushing Unix integration, and Perot Systems and IBM are courting facilities management. Such alliances will further the concentration at the high end of the systems integration market. Of the leading vendors in 1990, the top five have 50% of the market, according to Gartner Group.

Upshot: The biggest and best-focused vendors will become bigger and better focused in '91.

But be warned, says Irv Shapiro, president of Irv Shapiro & Associates in Skokie, Ill.: "IS needs to be careful when working with a system integrator who's in a particular area for the first time. Some vendors may be throwing baited hooks into the ocean to see where the bites are. Once they find the good areas, they may pull the other hooks out."

• **IS will play favorites.** Preferred vendor status will move into the systems integrator realms. "If you've been a happy camper with a system integrator you've worked with in the past, who better to call?" Digrius asks.

For novice integrator customers, this kind of relationship building can be especially helpful. Joe Greulich, MIS manager at Roberts Express, Inc., a transportation services company in Akron, Ohio, agrees. Now in the midst of an integrated database project with Ameritech Information Systems and SHL Systemhouse, Inc., Greulich says, "If we did this again, our [vendor] list would be very short." □

Zottola is a *Computerworld* senior editor, in depth.

Nicolas Aacia

Is this any way to begin a decade?

A humorous look at the goofs, gaffes and glitches that made 1990 the year that wasn't

BY PAUL GILLIN

JANUARY

In Delaware, a Control Data Corp. computer-based state lottery system goes haywire, allowing lottery agents to buy $555,000 worth of winning tickets after the winning number is drawn.

Savings and loan tycoon Charles Keating contracts with CDC to process the financial statements at Lincoln Savings & Loan.

AT&T's nationwide network crashes, crippling long-distance services across the country for nearly nine hours. MCI reacts calmly to its foe's troubles, taking out a series of full page ads reading "Nyah nyah nyah nyaaah nyah."

FEBRUARY

The Software Publishers Association announces plans to combat software piracy by staging unannounced raids on selected large businesses. The first raid on a major Chicago-area retailer nets 17 illegal copies of Lotus' 1-2-3 and a half-dozen pirated copies of Ashton-Tate's Dbase at a cost of only four lives. The SPA calls the bloody attack "a warning."

Lotus unleashes a mainframe version of 1-2-3. Analysts charge that Lotus still can't free itself from the PC mentality, noting that 1-2-3/M is delivered in a shrink-wrapped box the size of a Buick.

MARCH

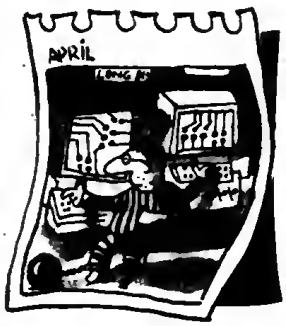
Former McCormack & Dodge president Frank Dodge sues Dun & Bradstreet Software, claiming he was forced out of the company. Dodge alleges that he was publicly humiliated by being locked out of his office. D&B Software vehemently denies that a snub was intended, pointing out that it was necessary to close Dodge's office while washing machines were being installed.

With Paperback Software International mired in a copyright suit with Lotus, Paperback Director Adam Osborne leaves to start a company that will build a "revolutionary" next-generation expert system product.

Aion Corp. reports that the source code to its next-generation expert system product is missing.

APRIL

Lotus and Novell stun the industry by announcing plans to merge. Signs of trouble emerge quickly, though, when the two companies clash over whether to serve crab canapes or mini egg rolls at the announcement press conference.



Leasing giant Atlantic Computer Systems all but goes out of business because of the collapse of a popular leasing program. The failure forces the company's IBM mainframe customers into a difficult choice between keeping their current equipment or upgrading to a 1990 Ford Taurus with the Power Option package.

Computer Associates announces that it will offer its own software architecture that supersedes those of IBM and DEC. The company says under the first stage of the CA '90s strategy, to be released in 1991, all product announcements will be printed on identical stationery.

Convicted Internet worm author Robert T. Morris is sentenced to three years' probation and 400 hours of community service. Morris chooses a volunteer job at AT&T headquarters in Morristown, N.J., working on the vendor's long-distance network.

MAY

The last major holdout to the surge of Microsoft's Windows support gives in as Lotus announces that it will port its 1-2-3 spreadsheet package to Windows, which is known inside Lotus headquarters as "The Great Satan." Lotus Chairman Jim Manzi dismisses the significance of the move, saying that the merger of Lotus/Novell will make Microsoft "dog doo-doo."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate $46 per year

*U.S. Only. Canada $56.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

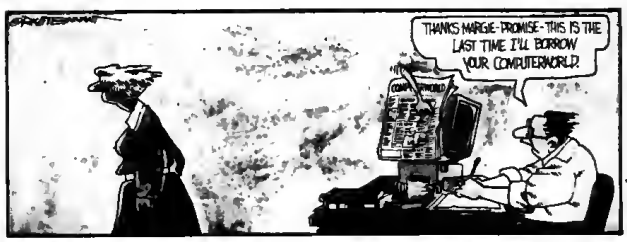
COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
89. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User Other _____
99. Vendor Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvrs. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor or consultant.
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4101F-9



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate $46 per year

*U.S. Only. Canada $56.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
89. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User Other _____
99. Vendor Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Comm
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvrs. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4101F-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

The Lotus/Novell merger falls apart at the eleventh hour as Novell suddenly demands an additional seat on Lotus' board, royalty rights to all Lotus products, a fleet of Cadillac limousines and season tickets to the Boston Celtics. Manzi learns of the disaster while on vacation at Disney World.

Microsoft introduces Windows 3.0 to widespread critical acclaim. Bill Gates sends Manzi a Federal Express package containing 1,000 plastic "dog doo-doos."

IBM releases the first version of its Repository Manager. Although the initial product consists of little more than a blank computer tape, every software vendor in the world announces plans to standardize on it, and a 400-member user group forms.

Japanese scientists say they have developed a computer with as much intelligence as Leona Helmsley, but they can't think of a use for it.

JUNE

Hitachi Data Systems announces a new family of processors that for the first time exceeds IBM's high-end offerings. The company denies charges that it is moving aggressively toward the mainframe market, noting that it positioned its announcement as far from Pearl Harbor Day as possible.

Lotus wins its "look-and-feel" lawsuit against Paperback Software. As punishment, the judge forces Paperback Software to assume all responsibilities for marketing Lotus' Manuscript word processor.

Lotus shocks the industry by announcing plans to merge with Oracle Systems.

JULY

Ashton-Tate finally ships a clean version of Dbase IV, 18 months after bug reports forced it to pull the original Dbase IV off the market. An Ashton-Tate spokesman says the fuss over the original product's problems were simply a result of confusion. "Did we say Dbase? We meant Dbeta-test," he says.

CA hits a financial brick wall as the nearly billion dollar company reports that quarterly revenue will fall well below last year's figures. The company says that it can't explain the slowdown except that for some reason, customers are having a problem understanding its strategy behind selling 32 different database management systems.

The Lotus/Oracle merger falls through at the last minute as Oracle demands full control of the board of directors, the right to produce 1-2-3 clones, a corporate jet and a seat on the Cambridge, Mass., city council. Manzi is informed while playing tennis in Guadeloupe.

AUGUST

After years of denying that it is overstaffed, DEC finally admits that it must cut its work force by 5,000 people, beginning with the 1,200 employees in the corporate Brushless Car Wash Department.

Charges are dropped against a 20-year-old hacker after prosecutors discover that information he allegedly stole from Bellsouth could be purchased from the company for a small fee. We are not making this up.

A blackout plunges New York's financial district into darkness, paralyzing the nation's securities trading markets. The failure is traced to a volunteer's cubicle at AT&T's Morristown, N.J., headquarters.

IBM says it is repositioning Systems Application Architecture (SAA) as "a grand architecture for all mankind," and will expand the SAA umbrella to encompass Unix, VMS, Apple Macintosh, Wheel of Fortune, bacon double cheeseburgers and all General Motors vehicles made since 1983.

Lotus announces plans to merge with Amdahl.

SEPTEMBER

IBM rolls out the most ambitious mainframe announcement in 25 years, replacing its System/370 with a radical new architecture consisting of millions of digital watches running in parallel. Analysts are quick to praise the IBM initiative but lambaste the System/390 for its annoying tendency to beep in movie theaters.

Wall Street darling Oracle Systems shocks investors by taking a $36 million quarterly loss. At a caviar and Dom Perignon luncheon at Tavern on the Green, Chairman Larry Ellison, dressed in a little black crushed velvet Italian number that matches the upholstery in his Ferrari, denies that expenses are out of control.

The Lotus/Amdahl merger falls through when the companies can't agree on whether to order the blueberry pancakes or the corned beef hash. Manzi is called back from the golf course.

OCTOBER

Compaq says it has solved problems that caused cases to crack in earlier versions of its notebook computer line. The new Compaq Rambopro comes in a molybdenum shell with a backlit screen covered by inch-thick plate glass. While analysts concede that the unit is sturdy, they question whether its 38-pound weight justifies the notebook label.

Apple finally gets into the low-cost computer business, introducing three Macintoshes. The company manages to trim costs substantially by removing the "Q" and "X" keys from the keyboard. "People rarely use them anyway," Apple CEO John Sculley says.

IBM researchers announce they have developed a microprocessor so small that no one cares.

Lotus announces that it plans a "merger of equals" with AT&T. An AT&T spokesman says this is the first he's heard of it.

NOVEMBER

Concerned about mounting losses, Unisys bands with similarly troubled Eastern Airlines in a joint promotional deal. Beginning in November, fliers on Eastern routes will each receive a free fourth generation language.

The U.S. government announces that injury claims associated with repetitive motion — such as typing — soared in 1989. Government spokesman Steve Ballmer says problems can be avoided if users switch to using mice and "insanely great" software such as Microsoft Windows.

Three members of the so-called Legion of Doom hacker group are sentenced to prison for breaking into Bellsouth computers. However, all three quickly escape by beheading the troll that guards the Cavern of Silver and whispering the magic password into the Lantern of Darkness.

DECEMBER

AT&T launches a hostile takeover bid for NCR, claiming that it wants the acquired company to run its foundering computer business. NCR Chairman Charles Exley spurns the offer, threatening to hold his breath until he turns blue. He is later coaxed off a fourth-story ledge at NCR headquarters in Dayton, Ohio.

Ashton-Tate'a copyright infringement suit against Fox Software is thrown out of court when the judge rules Dbase itself was lifted from a public domain application. Paperback Software immediately files a countersuit against Lotus, claiming the idea for 1-2-3 was ripped off from an order of 15th-century Franciscan monks.

Data General announces a voluntary severance plan whose terms are so attractive that company founder Edson de Castro lays himself off.

COMPUTERWORLD'S

1991 All-Star Team

Yes, it's a bold idea: Create a committee of esteemed and interested computer industry observers to assemble the winningest, bitchin'est executive team ever. This dream team — composed of a board chair, chief executive, operating, financial and technical officers — would oversee the inner and outer workings a fictitious, medium-size computer company that produces a variety of hardware and software devices.

The result (drumroll, huzzah and fanfare) is *Computerworld*'s 1990 All-Star Team of computer company executives. — JIM NASH

Chief Operating Officer
John Sculley
Age: 51
Chairman and CEO of Apple Computer, Inc.

A noted outsider in the computing community, Sculley is the only all-star who comes close to having a traditional business background. One fan said Sculley "has shown that he can roll up his sleeves and get the job done — once he decides what the job is."

Decisiveness definitely works in Sculley's favor: Committee members liked his willingness to change lazy people and time-honored policies.

Big talents: Detailed determination, outsider viewpoint.

Runner-ups: Dark horses 3Com Corp. CEO Eric Benhamou and Network General Corp. CEO Harry Saal.

Chief Financial Officer
H. Ross Perot
Age: 60
Chairman, Perot Systems Corp.; board of directors, Nextt, Inc.

The popular runner-up to Microsoft's Bill Gates is one of the last loose cannons in high tech. According to legend, Perot's first job was breaking horses for $1 apiece with his father in Texarkana, Texas.

Perot's advocates said he could act as a shield between Gates, Sculley and John. His golden touch doesn't hurt, either. "Nothing he has ever touched has had money problems," one member observed.

Big talents: Dynamic management, financial foresight.

Runner-up: Richard Miller, CEO at Wang Laboratories, Inc.

Chief Executive Officer
Steve Jobs
Age: 35
Chairman, CEO of Next

The No. 2 pick is a mover — from Hewlett-Packard Co. to Atari, Inc. to Apple to Next. His strong suit is his ability to sell a product to investors and consumers. Said one associate said, "He has a knack for looking at current technologies and guessing the trajectory of the resulting products."

Another committee member praised Jobs' maturing leadership skills: "He is a genius who is capable of inspiring the other geniuses of the world."

Big talents: Product salesmanship, tenacity in making sure a product gets to market.

Runner-ups: Bill Gates and Compaq Computer Corp. CEO Rod Canion.

Chief Technical Officer
Bill Joy
Age: 35
Vice President of Research and Development, Sun Microsystems, Inc.

The co-founder of Sun stole the chief technical officer show. "He's a helicopter way above us all," one committee member raved. "He's smart like nobody's business," another stated.

Joy's biggest talents, everyone agreed, lie in his Unix expertise. He designed the University of California at Berkeley version of the operating system while a graduate student at the university.

Big talents: Team player, technical brilliance.

Runner-ups: Steve Wallach, vice president of technology and board member, Convex Computer Corp.

Chairman of the Board
Bill Gates
Age: 35
Chairman, CEO and co-founder of Microsoft

Everybody's choice for the top spot. "Bill's extremely intelligent," one committee member explained.

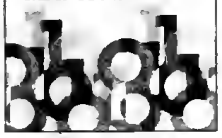
Gates has always drilled his own drum. Committee members praised his stubborn aggressiveness and alacrity in dealing with dangerous partners such as IBM. "When you see people go toe-to-toe with large competitors and they pull it off, it says something about the individuals involved," one member said.

Big talents: Ten-year vision, diplomacy and technology salesmanship.

Runner-ups: Compaq Chairman Ben Rosen, IBM Chairman John Akers.

Special thanks to the following members of the committee: Dick Scheffler, Technologic Partners; Neil Bell, Kaiser Permanente; Andy Bayliss, Octagonal, Inc.; Robin Byron, Edwards Holdings, Inc.; Nina Burns, Network Management Solutions; Sheldon Laube, Price Waterhouse; Jon Ervin, Bancomerica Systems Engineering; Dick Berry, Union Life Insurance; John Rebel, Alex. Brown & Sons, Inc.; Gary Chapman, Computer Professionals for Social Responsibility; Julian Harwich, Chicago Association for Management Professionals; Si, Victor Jongeleis, Positive Support Review, Inc.; Alice Brodie, Hambrecht & Quist, Inc.; John Logan, Aberdeen Group; Frank Dzubeck, Communications Network Architects, Inc.

outlook:
APPLICATION DEVELOPMENT AND DATA MANAGEMENT



Broad strokes, fine details

BY MARY BRANDEL

For some vendors of application development and database management tools, the next 12 months will fill in the big picture that's been touted for a year or more.

For others, there's never been a better time to pull out their best crayons and make their mark.

Here is what's visible so far:

• **AD/Cycle remains sketchy.** IBM delivered on its application development promise and its Repository blueprint in 1990. But "1991 is not the year for AD/Cycle. It's still in transition," says Jeff Tash at Database Decisions in Newton, Mass.

Instead, the next 12 months will be a time for customers to learn about the new environment, he says. IBM and its business partners will need to make good on the promise of an integrated Repository environment. That means we should see third-party tools with initial links to Repository Manager.

This doesn't mean there will be silence on the AD/Cycle front, though. "Look for incremental releases of additional interfaces for AD/Cycle, including one that lets PCs share Repository data," says Robert Binder, principal at Robert Binder Systems Consulting, Inc. in Chicago.

Meanwhile, customers will wait to hear from Index Technology Corp., Bachman Information Systems, Inc. and Knowledgeware, Inc. The big issue is how these tools will be adapted to link directly to Repository Manager.

• **Cohesion takes shape.**

Continued on page 28

Desktop bonanza ahead

New technologies will make room for themselves this year

BY MICHAEL ALEXANDER

Maybe it should be called the "Year of the Great Amalgamation," because that's what 1991 is shaping up to be. This will be the year in which a wide variety of new and emerging technologies converge on the desktop.

Object-oriented databases, electronic imaging, neural networks and, especially, multimedia are among the technologies expected to take on much greater importance in 1991, according to several experts.

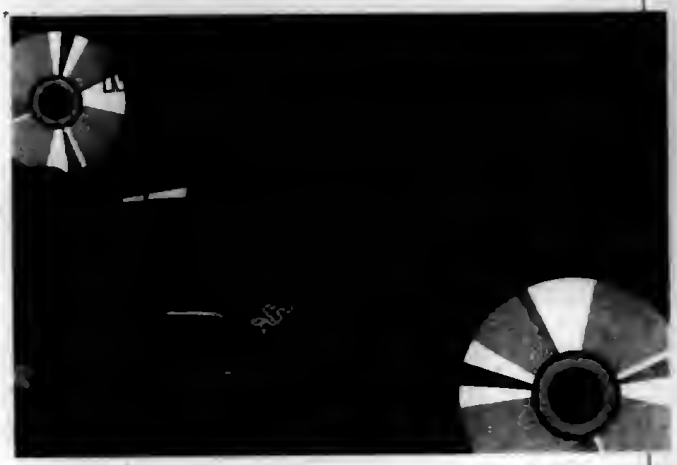
In the coming year, corporate advanced technology groups will also be looking closely at imaging technology, technology watchers say.

But networking will be corporate America's No. 1 technology investment, says Mary Rhodes, a senior analyst at New Science Associates, a consulting firm based in Southport, Conn.

Here's a closer look at some key technologies for 1991:

• **Multimedia.** Applications are already moving rapidly into the marketplace, and that pace will quicken in 1991.

The recent agreement between Microsoft Corp. and IBM to cross-license Windows and OS/2 extensions in 1991, based on a common set of multimedia specifications, will help kick multimedia into high gear, according to several analysts.



David Flaherty

"We see four major growth areas for multimedia applications," says Nick Arnett, president of Multimedia Computing Corp., a research firm in Santa Clara, Calif. "Learning and corporate education; sales and marketing and other persuasive business presentations; technical documentation for maintenance and repair; and scientific and engineering visualization."

Intel Corp. introduced a two-chip set for Digital Video Interactive in late 1990 that now makes it possible for a manufacturer to put multimedia capabilities into a desktop computer for about $1,000. This is a big leap in price/performance, which could begin to pay off handsomely for companies pursuing multimedia in 1991.

Because the multimedia market is so young, estimates of its value vary wildly. Depending on the definition used, sales in 1991 are estimated at between $500 million and $15 billion.

But analysts agree that it's still too

Continued on page 28

Small is big in PC land

BY RICHARD PASTORE

In 1991, a whirlwind of change on the portable personal computer horizon will fashion a smaller, cheaper and more powerful PC landscape.

Among the key developments:

- A glut of Intel Corp. 80386SX-based notebook PCs.
- Price decreases of as much as 35%.
- A 40% to 50% increase in U.S. laptop shipments.
- Rechargeable batteries that can outlast typical nickel-cadmium cells by 50%.
- Low-priced units based on new chip sets developed specifically for portables.
- Possible laptop PCs from IBM and a newer Macintosh portable from Apple Computer, Inc.
- Advances in affordable, easier-to-read color displays.

In 1991, the hot commodity is going to be the 386SX-based notebook-size computer, predicts Andrew Seybold, an analyst at Dataquest, Inc. in San Jose, Calif.

Despite the lack of volume shipments, it's clear that the industry's new darling will be SX IBM-compatible portables weighing less than seven pounds.

Comdex/Fall '90 was a precursor of the SX squalls to come. Intel's booth, for example, harbored some 14 prototype SX notebook machines. Richard Horan, editor-in-chief of *Portable Technology Update* in New York, says he counted a total of 50 386SX-based notebook announcements or prototypes on his Las Vegas rounds.

Price wars seen

What does the product glut mean for users? Price wars. Compaq Computer Corp.'s initial $7,000 benchmark price for its LTE 386SX has already been undercut several times: $1,000 by Texas Instruments, Inc.'s Travelmate and $3,600 by AST Research, Inc.'s Premium Exec 386SX/20, to name just two.

"We are forecasting a major price war to last for a year to a year and a half," says William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. By the end of 1991, SX notebook prices will be approximately $2,500 to $3,000, he predicts.

As prices fall, more users will be pulled into the portable tempest. In fact, portables will be the only area of growth next year for the PC industry, according to Bluestein and other analysts.

According to Forrester, unit sales of portables weighing less than 15 pounds will make up 18% of all PCs purchased by nonhome/education buyers next year, up from 12% this year, according to Forrester.

Continued on page 29

Application

CONTINUED FROM PAGE 27

Expect a lot of action from Digital Equipment Corp.'s computer-aided software engineering (CASE) strategy. DEC plans to release CDD/Repository in the first half of 1991, and "virtually every vendor has signed up with DEC" to develop compatible CASE tools, says Vaughn Merlyn, chairman of CASE Research Corp. in Bellevue, Wash.

• **TI gives Unix extra gloss.** This could be the year that Texas Instruments, Inc. steps out of the shadows of AD/Cycle. A key will be continuing beyond the IBM mainframe market and into the open systems arena. "TI could do for CASE what Oracle did for the DBMS market," Merlyn says.

Not that there aren't already CASE tools for Unix. What TI has, however, is a set of integrated tools. "TI's integrated dictionary is here today," Tash says, "and they're maneuvering to find markets where they'll be most successful. They could come out with a full, integrated tool set for Unix."

In 1991, buyers should see the release of TI's Information Engineering Facility for Tandem Computers, Inc.'s Nonstop and DEC's VAX/VMS. "There's no doubt there's a vacuum to fill in CASE products for Unix," Merlyn says. "The question is, is TI big enough to do it?"

• **The rainbow effect.** Expect to see some jostling and positioning. "This will be the year to determine whether Computer Associates can regain some past successes of Cullinet and ADR," Tash says. The firm has a lot to offer people interested in downsizing, he adds.

Also, with Oracle's financial woes and Ask Computer Systems, Inc.'s recent purchase of Ingres Corp., Sybase, Inc. may change the position previously held by the two database management system leaders.

• **The object-oriented outline.** The term object-oriented will continue to buzz on both the DBMS and applications development fronts. IBM will announce support for object-oriented languages on AD/Cycle, with its first offering being Smalltalk in the first half of 1991. It will be 1992, however, before the Repository Manager Information Model will accommodate objects. This could be the year that DB2 gets some object-oriented extensions as well, according to Tash.

DEC will introduce its object oriented language Trellis for the commercial market, and it has a joint arrangement with Objectivity, Inc. to develop an object-oriented database.

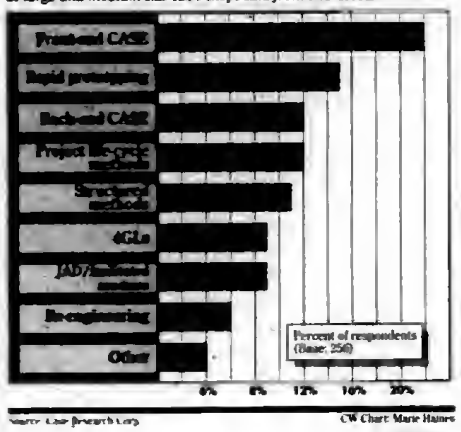
• **Distributed . . . finally?** Look for IBM to continue its quest for a distributed database. The firm will say in 1991 when it can provide links between its VM and MVS mainframe databases and has hinted about availability for other links, too. This hint means we may finally find out when the OS/2 database manager can talk to DB2 and other host DBMSs. But the goal to unite its four Systems Application Architecture databases is still years away.

At DEC, RDB will become interoperable with DEC's other databases via Network Application Support, and interoperability with Oracle databases should appear in late 1991. □

Brandel is a *Computerworld* senior editor, product spotlight.

Promising developments

When asked about the most promising approach to improving systems development in their organization, the majority of software developers at large and medium-size IBM shops said front-end CASE



Source: Case Research Corp. CW Chart: Marie Haines

Desktop

FROM PAGE 27

soon for the compelling business applications that could drive the multimedia market in the same way that spreadsheets fueled the advent of personal computers.

The missing link is multimedia standards for the way information is stored, manipulated and presented under multimedia applications. However, industry watchers say that standards in these areas will begin to fall into place next year.

Two groups within the International Standards Organization — Joint Photographics Experts Group and Motion Photographics Experts Group — are developing standards for still video and full-motion video, respectively.

Thus, what will be important about multimedia in 1991 is its expected impact on compression technology and standards, digital signal processing, video digitizing, optical storage and networks. And because multimedia often includes combinations of audio, video and other copyrighted material, experts say the issues of intellectual property ownership and royalty payments will also heat up in 1991.

• **CD-ROM.** More flavors of compact disc/read-only memory (CD-ROM) optical-disc technology will debut this year, bringing new multimedia capabilities to desktop computers.

Compact disc interactive (CDI), developed by Philips N.V., will pick up momentum with the introduction of consumer players, some experts believe. CDI in its current form is capable of storing 7,000 images or 72 minutes of full-screen, full-motion animation, along with digital stereo audio.

An extended architecture format of CD-ROM, called CD-ROM XA — which combines the audio and video capabilities of CDI and the industry standards of CD-ROM — will also debut. Some believe it could become a standard in its own right.

IBM will officially throw its weight behind an optical-disc technology and at the same time "legitimize" the technology, Rhodes predicts.

"Managing the storage demands, retrieval times of optical storage, the emergence of color and how it will be shipped across the network," will also become pressing issues in 1991, she adds.

• **Multimedia databases** that blend audio, video, text and other forms of data will inch closer to the mainstream in 1991, analysts say.

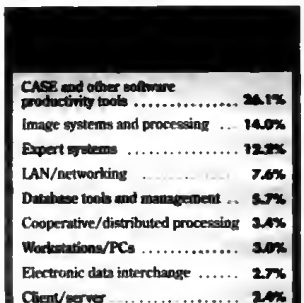
How to manage, manipulate and retrieve this diverse mix of information will be one of the key challenges facing vendors this year. The databases will be aimed at individual users rather than the distributed databases aimed at organizational computing. The solution will be found in object-oriented technology that will enable users to customize databases to suit their specific needs.

Several major vendors, including Oracle Systems Corp., are working on object-oriented DBMS products. Traditional database vendors such as Ingres Corp. and Sybase, Inc. will begin to feel competitive pressure as object-oriented databases start receiving more attention.

• **Image processing,** still in its infancy, is outpacing all other segments of data processing, according to some analysts. BIS CAP International, Inc., a Norwell, Mass.-based research firm estimates the market will reach $2 billion by 1993.

IS views its future

Software development tools and imaging lead the pack of emerging technologies that interest top IS managers most



Source: Index Group, Inc. CW Chart: Doreen St. John

THE MISSING LINK is multimedia standards for the way information is stored, manipulated and presented under multimedia applications.

• **Networking.** Both local and wide-area networks continue to be a priority for Fortune 1,000 organizations.

A recent *Computerworld* survey of *Computerworld Premier 100* companies showed that nearly two-thirds considered networking and related technologies to be "the most critical" technology for competitive success over the next five years. LANs, in particular, were judged to be most important: They were cited by one-third of the respondents.

According to the Boston-based research firm The Yankee Group, communications budgets at Fortune 1,000 companies will rise an average of 6.1% in 1991.

With the growing popularity of LANs, many users may find a darker side to using them.

"I expect to see more companies will start finding problems with local-area networks and start questioning why they are using them," predicts Norman Weizer, senior consultant at Arthur D. Little, Inc. in Cambridge, Mass.

"With more work being done on the desktop, LAN security will become more important than ever," agrees Patrick Corrigan, managing director of Corrigan Group Information Services in San Francisco and co-author of *Building Local Area Networks*.

"The major network operating systems like Netware have pretty fair security," he continues. "The weak link in all of this is that it is easier to get access to a LAN system than a mainframe."

Yet despite these security concerns, Weizer predicts that expectations for LANs will continue to rise, causing companies to seek even greater use of the technology. He predicts that groupware and electronic conferencing in particular will become more prevalent.

• **Neural networks,** while still far from widespread commercial acceptance, will continue to mature this year. Several firms including IBM and Intel have been putting research dollars into software and chip technology.

The results of those efforts may begin to pay dividends in the latter part of 1991. The market for the technology will be about $100 million in 1991 but is expected to soar to $1 billion by the mid-1990s, according to some analysts.

• **Windows applications.** Among the other interesting areas will be more Windows-based applications that will expand the computing capabilities of both naive and experienced users, analysts say.

• **Laptop computers** running Windows-based applications will also be hot (see story page 27).

"That is going to be a screamer [in 1991]," Weizer says. "People who would not have considered it before will now in fact be willing to give up their under-[airplane]-seat space for it."

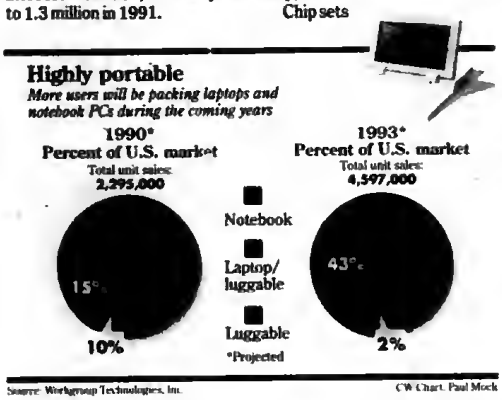
• **X-Window terminals** will also be judged useful or not by many corporations in 1991. For many, the choice will be between X-Window terminals and diskless PCs. □

Alexander is *Computerworld*'s senior editor, advanced technology.

PC land

FROM PAGE 27

While the research company predicts a 10% decline in desktop PC shipments, it says laptop system unit sales are expected to increase from 832,000 this year to 1.3 million in 1991.



Industry developers, lured by potential profits, should soar to new heights of technological innovation.

"Since the notebook market is about to take off like crazy, people are finally going to put the research dollars into battery technology," Seybold says.

Better batteries

One advance already getting attention is the nickel-hydride battery. The new design can yield a 50% greater life span than the typical three hours of the nickel-cadmium battery. Alternatively, the new batteries can offer the same life expectancy at half the size and weight.

A typical example is the nickel-hydride battery that is scheduled to ship with Toshiba Corp.'s $5,499 T2000SX system in January, 1991.

Chip sets

designed by Intel and Advanced Micro Devices, Inc. specifically for portables will also show up in machines from at least 20 vendors in 1991, according to analysts.

Because the chip sets consolidate previously separate components and controls, they make it cheaper for systems vendors to design and build smaller machines. This should in turn smooth the way for more low-priced notebook systems to enter the market.

The chip sets — the Intel 386SL and AMD AM286ZX and LX — are designed to require less power, further enhancing the potential for boosted battery life spans in portables using the chips.

New entries, pockets

The appearance of rumored new units from IBM and Apple will add zest to the portable zephyr. Even if the machines fail to appear or turn out to be flops, it probably won't be enough to slow market momentum.

Few Intel 1486-based portable systems are due yet. Despite IBM's entry into the portable 486-based arena this fall, next year will find machines from only a few firms chasing a small, highly specialized niche market, analysts agree. They note that few people feel they need a 486 on their desktop, let alone under their arms.

Pocket-size portables, which garnered a lot of attention this year for their novel packaging, will largely remain novelties in 1991. Observers say the machines trade off too much functionality for size and are unlikely to capture more than a specialty market.

While users acknowledge and appreciate the growing power and shrinking size of portables, "they're still a little off from what people want and need," says Steve Leopold, a portable computer user at Anritsu America, Inc. in Oakland, N.J. "I'll be happy when they come out with a nice color display that's cheap."

"Even if we don't move affordable color to the laptop, it will make it to the larger portables and may even put a little spark back into the transportable category," says George Thompson, an analyst at Datapro Research, Inc. in Delran, N.J.

Sharp Electronics Corp., a pioneer in portable color systems, will unveil its AC-powered, 15-pound Color Star unit next year for $10,000 to $15,000. Toshiba's color T5200C is already shipping and costs $9,499.

With or without color, the portable computer market will continue to evolve toward most users' ultimate goal — a powerful, uncompromising desktop personal computer that fits in a glove compartment and is as light as a summer breeze. □

Pastore is a Computerworld senior writer.

It's Shakeout Time

While a boom in the laptop market is good news for buyers, analysts say the competitive cyclone being whipped up by portable PC vendors may carry away several smaller competitors.

"The whole category is growing very rapidly, but the majority of manufacturers are finding it very unprofitable," says Dick Shaffer, president of Technologic Partners in New York.

According to Shaffer, only high-profile manufacturers with distinctive products — including Toshiba, Compaq and Zenith Data Systems — can hope to prosper.

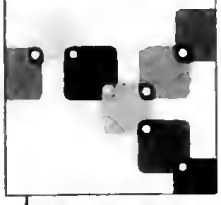
Other analysts say that even portable heavyweights such as Compaq could get battered. Already, a half-dozen competitors — including Texas Instruments, Inc. and AST Research, Inc. — have announced 386SX-based notebook PCs that underprice and/or outperform Compaq's fall 1990 LTE introduction.

Ironically, observers say it is likely that Compaq's newest LTE will divert sales from its other portables, especially its 386SX-based laptop, the SLT. "We think there will be some cannibalization of the SLT," says Lorie Strong, a Compaq product marketing manager. "But there's not enough LTE volume shipping yet to understand the effects."

RICHARD PASTORE

Get ready: More's coming

outlook: NETWORKING



BY JOANIE M. WEXLER

Buyers will see vendors responding with a new generation of networking choices in 1991. Several networking technologies will emerge, providing users with more connectivity, faster network speed and better bandwidth management. Among them:

• **Enhanced virtual private network services.** Public and private wide-area telecommunications suppliers will be butting heads with a variety of products and services. Major long-distance suppliers, in particular, will be beefing up their offerings.

Virtual private networks let users allocate a portion of the public network between their premises and a carrier's central office. The idea is to provide the advantages of a private network to companies lacking the traffic for dedicated communications lines.

MCI Communications Corp. will roll out a "shared network" service in 1991. U.S. Sprint Communications Co. will provide virtual network service internationally during the first quarter.

Private vendors will also continue to aggressively court users who need the high speeds and bandwidth management required for applications such as remote local-area network interconnection, imaging, videoconferencing and computer-aided design.

• **New public services.** Public carriers are striving to keep pace with the high-speed data networking technologies being rolled out by private companies.

AT&T says it will deliver a 384K bit/sec. version of its Software Defined Data Network in the first quarter. A 1.5M bit/sec. option is set to be released in the third quarter. The carrier has also committed to a first-quarter rollout of its Accunet T45 Reserved Service. The service will allow users to access 45M bit/sec. bandwidth on a demand or scheduled basis.

MCI says it will provide switched T1 and switched T3 services by the third quarter.

• **Frame relay, switched T1 and T3 and switched multimegabit data service.** Public carriers are working feverishly to compete with high-speed switched services that can accommodate video and other high-bandwidth applications.

"Buyers must continue to evaluate switching technologies, including multiplexed circuit switching, frame relay and cell relay," says Phil Evans, president of the International Communications Association.

Frame relay is a form of packet switching that moves data faster because it eliminates error detection and correction in each network link. Cisco Systems, Inc. and Stratacom, Inc. are already shipping products. Timeplex, Inc. has just started shipping a cell-relay product line.

The best choice is still unclear and is a major issue to be decided in 1991, says Lionel Gillerman, vice president of regulatory affairs at the Tele-Communications Association.

The big decision, adds Todd Dagres, director of communications research and consulting at The Yankee Group in Boston, will be whether companies should implement frame relay themselves or work with the local telephone companies in implementing switched multimegabit, an emerging 45M bit/sec. packet-switched data service.

• **FDDI as backbone technology.** Expect to see Fiber Distributed Data Interface (FDDI) as a key backbone in the latter half of 1991. "The standard is in place, products have rolled out and companies are going to exceed the capacity of 16M [bit/sec.] token-rings and 10M bit/sec. Ethernets," Dagres says. Some 20% of Fortune 1,000 firms will explore FDDI backbones, and some will even build production systems, he adds.

Prices for the fiber-based 100M bit/sec. LAN are expected to remain high for another year or two.

• **Interoperable LAN operating systems.** Personal computer/LAN interoperability will be hot in 1991. Analysts say users are demanding it.

Banyan Systems, Inc. will not commit to a link with Microsoft Corp.'s LAN Manager in 1991. Similarly, Novell, Inc. — with 55% of the LAN market share — is mum on linking its Netware LANs with other LANs.

"But there will be increasing pressure on LAN vendors to provide hooks to competitors' networks," says Kevin O'Neill, vice president of network research at Business Research Group in Newton, Mass. Dagres adds: "If they don't, someone else will."

Even IBM has announced that it will be providing hooks from Netware to its Netview network management system during the second quarter of 1991.

• **Wireless LANs.** In 1991, wireless technology will emerge as a cabling alternative, Dagres says, if the cost per connection can come close to shielded twisted pair. Motorola, Inc.'s 15M bit/sec. microwave technology announced last fall, for example, is set for availability in the first-quarter. □

Wexler is a Computerworld senior writer.

outlook:
PRINTERS AND OUTPUT DEVICES

Speedier, cheaper, colorful

BY STEFANIE MCCANN

Whether your users are doing simple memos or printing catalogs and big proposals, price, speed and color are expected to make their lives easier in 1991.

• **Print is cheap.** Look for lower prices on all types of printers. Competition and maturing products are the main reasons, says Larry Jamison, an analyst at BIS CAP International, Inc.

Prices for desktop impact printers will drop as low as $2,000.

• **Variations on a ream.** Analysts say not to expect many new printer technologies in 1991 — only enhancements. One hot new technology is dye diffusion, which uses a film with ink capsules. Heat breaks up capsules, and the ink gets transferred to the paper. Analysts say the process gives photographic quality.

• **Hot hybrids.** Multifunctional devices that combine facsimile, printer and photocopier into one device will be big. Typical of the new breed is Ricoh Corp.'s forthcoming DS320F, a $9,995 digital copier with fax capability. The DX-1 allows information to go directly from a personal computer screen to a fax machine, explains Tom Sandock, an analyst at BIS CAP.

• **Splashes of color.** Color may not be the biggest issue this year, but it will still be worth watching. Spectra, Inc. plans to release an OEM device for under $10,000 that it says plans to decrease the problem of ink chipping of paper. Eastman Kodak Co. will introduce a method of colorization in digital form that it says will improve speed and accuracy. □

McCann is a *Computerworld* editorial assistant.

"Hello, Europe? This is the U.S. calling"

BY ELISABETH HORWITT

Will this be the year that you can send a facsimile to Poland in less than a day? As barriers to international trade come tumbling down across the European business community, multinational firms are clamoring for a comparable opening of European communications services.

Especially desired are the competition, broader options and lower prices that often accompany deregulation.

Thus, 1991 could well be a watershed year for such improvements, coming as it does right before the official launch of the European open market in 1992 and after a year of key initiatives aimed at fostering pan-European communications systems.

However, firms are still encountering obstacles to setting up communications links to support marketing thrusts across Europe. Among the bigger problems are:

• **High rates.** Unreasonably high rates in some countries make an incoming call to the U.S. two to four times the cost of the same call in reverse.

Schindler Elevator Corp. recently held a meeting to break out the costs of a proposed U.S.-to-Switzerland link and discovered that "the U.S. half of the link would cost $3,000 and the Swiss half, $7,000," says Ed Hodgson, manager of computing and communications at Schindler.

Michael McLaughlin

• **Lack of digital connections.** Another problem is a scarcity of the high-speed digital connections that U.S. firms have come to take for granted. "I think people still communicate in Austria by building signal fliers on a hilltop," says Hodgson, whose company recently considered network options in that nation.

• **Differing standards.** A link from Italy to Sweden, for example, involves buying circuits separately from every Postal Telephone and Telegraph authority (PTT) in between — each with its own pricing, interfacing and equipment buying rules.

"In country A, you can only attach a modem specified by that country, sold by that PTT; in country B, you can use any modem," explains Donna Valtri, manager of network services marketing at GE Information Services. The European Community's Council of Ministers attempted to address the situation last summer by proposing the Open Network Provision (ONP), which calls for European carriers to "harmonize" their tariff structures and equipment provision regulations. An important component of ONP is a common standard for interfacing equipment with carrier-based services.

How quickly a truly open, competitive, pan-European network environment develops depends a great deal on how much pressure the European Commission and major users can bring to bear on recalcitrant countries.

The UK, France, Spain, Germany and Italy have all become highly attuned to business users' needs as they jockey for the position of most-favored hub of global networking.

"They're all in the throes of deregulation and hungry for business," says Douglas Fields, telecommunications manager for information services at United Parcel Service, Inc.

Some major advances can be expected from the Eastern European nations. Several countries are already talking with value-added network providers and seeking to "build an infrastructure where none exists," often with foreign help, Valtri says.

The real question is how fast the pan-European communications movement will invade the middle tier — countries that continue to support their PTTs' monopolies but stand to lose much if they do not join the open communications movement.

The European Commission targeted such protectionist policies last summer in its ONP by calling for PTTs to give value-added network providers and other network services guaranteed access to basic national telephone services.

However, the commission may not be able to make such adjurations stick. Here again, global firms may provide the needed commercial impetus where official bodies fail. Schindler has also been pressuring AT&T to deploy a switched 64K bit/sec. link to Switzerland via its Switched Digital International service. Companies like Schindler, with present and growing global communications needs, are likely to stay frustrated with what seems like a snail's pace toward viable pan-European networking. Still, significant improvements are coming:

• International circuit prices should fall on an average of 20% per year across Europe during the next five years, according to Stamford, Conn.-based research firm Gartner Group, Inc.

• Digital switched services are extending their reach, both within Europe and between the U.S. and Europe. AT&T's 64K bit/sec. Switched Digital International service provides savings over dedicated lines.

AT&T plans to expand the service to at least 10 more countries in 1991 and will also expand the bandwidth to 384K bit/sec. at an undisclosed future date.

• Virtually every major European country has promised that International Services Digital Network (ISDN) "will be available to everyone by 1992," says David Thunder, Gartner Group's program director of European Telecommunications Strategies.

• The Consultative Committee for International Telephony and Telegraphy recently announced approval of a global ISDN signaling standard, Q.767, which should finally make it possible for various carriers in Europe — and perhaps even the U.S. — to interconnect their ISDN services directly rather than through traditional switched 56K bit/sec. circuits.

• Several consortia are rumored to be jockeying for the chance to provide a pan-European broadband digital network.

The project will at long last mesh communications services throughout the various nations, says Jeremy Frank, Gartner Group's vice president of European telecommunications: "I hope that more than one will do it, because that would lower circuit prices, which are real expensive now." □

Horwitt is a *Computerworld* senior editor, networking.

Gloom looms over high-end market

BY ROSEMARY HAMILTON

In 1990, IBM and its mainframe rivals, Amdahl Corp. and Hitachi Data Systems Corp., put their cards on the table. In 1991, we'll see how willing customers are to play the game.

As 1990 ended, user reaction to the new generations was positive. But despite the upbeat response over the increased capacity and new technology that the Big Three plan to deliver this year, the mainframe market can't avoid taking a hit from gloomy economic forecasts.

Whether the grim predictions will actually hurt sales is unclear right now. Industry experts say economic uncertainty will spark even fiercer competition and backroom discounting of 35% to 50% will continue to be the norm.

Vendors differ on the seriousness of the economic outlook (see story this page). In any case, the mainframe providers have no choice but to simply plow ahead with their plans. Analysts have labeled 1991 "a transition year" as the three players get ready to deliver a new generation of systems.

Here are some of the highlights that buyers can expect from the mainframe market in 1991:

• **In with the old, in with the new.** The Big Three mainframe vendors will try to sustain the older generation of systems while drumming up business for the new models, most of which are scheduled for shipment beginning in the second quarter.

"Basically, [the vendors] will all be buying time," says Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass. Gens expects customers to keep pressing vendors for discounts in the "35% to 50% range on the large competitive bids" until the new generations are available.

• **Year of the Big MIPS.** Hitachi is determined to be first to market with big millions of instructions per second (MIPS) machines. The company plans a second-quarter delivery of a high-end model that runs at about 150 MIPS.

But don't be surprised if IBM, hoping to beat Hitachi, will "work overtime to deliver its 200 MIPer in the second quarter," Gens says. IBM's top-of-the-line Enterprise System/9000 is scheduled for shipment in the third quarter of 1991.

Hitachi and IBM will be joined by Amdahl in the fourth quarter when it starts shipping systems in the 150 MIPS to 200 MIPS range. Then all three vendors will be in a dead heat in terms of the system performance that they can provide.

Thus, 1990 will end with a twist: This will be the first time in recent years that all three have competed for the high-stakes, high-end business. In the past, Hitachi has been confined to lower end mainframe sales.

• **Baby brother systems.** After 1990's product blitzes, customers might consider a lull in rollouts good news. Some information systems managers are still reading through the 1,000-plus pages of customer letters from IBM's Sept. 5 announcement. But one of the more interesting introductions in 1991 could be some additions to those IBM volumes.

Some analysts predict that IBM will begin rolling down Summit technology to lower end ES/9000 models. Now, only the two high-end ES/9000s — the 820 and 900 — are based on next-generation technology. Gens says he expects IBM to begin replacing these hybrid models with Summit-based systems this year.

Hitachi has promised high-end announcements in the first quarter of 1991 but won't give any details.

Analysts say the obvious addition to the mainframe line would be five- and six-way models. While IBM announced a new-generation six-way system and Amdahl introduced an eight-way, Hitachi topped out with a four-way system last year.

• **Slow going on the Summit.** Count on only initial implementation of the new IBM mainframe architecture, System/390.

Highlights of System/390 were the new fiber-optic-based channel architecture, called Escon, and a system coupling capability, called Sysplex. But buyers will see no big ramp-up here; both will be delivered in phases. In fact, key pieces of Escon will not be available until late 1991.

In the first quarter, Amdahl and Hitachi are expected to announce when they will be System/390-compatible.

Analyst Bob Djurdjevic at Annex Research says IBM had initially indicated that System/390 would set the plug-compatible manufacturers (PCM) back 18 to 24 months. The PCMs are required to re-engineer their equipment to accommodate changes made by IBM when it introduces new software or hardware.

Meanwhile, Djurdjevic says, the PCMs were dropping hints that catching up with System/390 would be easier than attaining Enterprise Systems Architecture compatibility. □

Hamilton is *Computerworld*'s senior editor, systems.

A big year

The big three mainframe makers have high hopes for their newest high-end models

Hitachi

- High-end models in EX series
- Announced June 1990
- Maximum: 150 MIPS (4-way model)
- Available mid-1991

IBM

- Enterprise System/9000
- Announced September 1990
- Maximum: 200 MIPS (6-way model)
- Available late 1991

Amdahl

- New models of 5990 series
- Announced September 1990
- Maximum: 300-plus MIPS (8-way model)
- Available mid-1992

CW Chart: Doreen St. John

The Debate: To Buy Or Not To Buy

Everyone agrees the economy is in tough shape, but there's disagreement on how this will affect the mainframe market.

William Grabe, IBM's vice president and general manager of U.S. marketing and services, says it's difficult to determine what effect a recession would have on 1991 mainframe sales.

He points out that during economic downswings, customers tend to focus more on improving productivity, which he says IBM is well-positioned to do.

Others have different attitudes. Amdahl Chairman Jack Lewis says he is very concerned and suggests the economy will "overwhelm almost everything else" next year.

Hitachi Executive Vice President Jim Balassone says he is concerned but upbeat about next year, adding that IBM PCMs might actually benefit from an economic downswing. In a downturn, people are more concerned with cost, he says, and are more likely to convince management to look at PCMs if the savings are substantial.

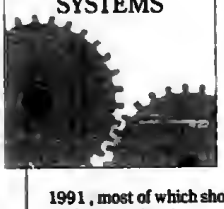
One industry analyst suggests the IBM mainframe market could ride out 1991 with little impact.

Mainframes, says Marc Schulman, a vice president at UBS Securities, Inc., "are purchased by long procurement cycles. Barring a real economic squeeze, the blood probably isn't going to flow."

ROSEMARY HAMILTON

Microsoft claims the desktop mantle

outlook: DESKTOP OPERATING SYSTEMS



BY PATRICIA KEEFE

With Microsoft Corp. firmly in control of the desktop, a welcome calm has settled on the opening days of the operating system market in 1991.

IBM has regained control of its baby, OS/2. But Windows 3.0 has won the corporate desktop for the next year or two.

Even so, several issues and products will pop up in 1991, most of which should further strengthen Microsoft's strong hand:

• **DOS keeps stinging.** Ever been stung by a dead bee? OS/2 has. DOS, once thought by many to be dead, actually has enough of a stinger left to drive decent OS/2 sales growth into 1992 and fend off Unix gains.

In 1989, desktop sales of Unix totaled a mere 400,000 units, according to Creative Strategies Research International. Sales will not hit the million-unit mark until at least 1991 — maybe. Meanwhile, DOS is expected to add 11 million units from 1990 to 1991.

In the meantime, OS/2 continues to operate in the shadows. It lives primarily in back-shop development projects at a small core of mostly IBM shops.

"Users have made a decision," according to David Marshak, an analyst at Patricia Seybold's Office Computing Group, "and it's Windows." Most developers will focus on Windows for the next two or three years, he says.

• **Fancier Windows.** Various enhancements — including multitasking, Truetype and handwriting recognition, as well as multimedia extensions to Windows 3.0 — are on the way. Windows will just keep getting more robust and all-encompassing, to the point where many developers expect that Bill Gates' pet operating environment will one day merge with OS/2. This could prove the kiss of death to the Presentation Manager interface, one developer close to Microsoft says.

• **Delivery of DOS Version 5.0.** Look for the newest version late in the first quarter. The announcement, combined with an outpouring of Windows applications and dropping prices in the Intel Corp. 80386 market will help push Windows over the top as the standard desktop environment in 1991.

• **Windows, OS/2 compatibility.** Microsoft has promised binary compatibility between Windows and OS/2, along with the tools necessary to enable Windows programs to run under OS/2. Once these are delivered, there will be no longer be any reason to develop separately for OS/2, says Brian Livingston, a network consultant.

• **OS/2 Lite.** Although IBM Executive Vice President Lee Reisweig predicts that the recently released 2M-byte OS/2 Version 1.3 will be the biggest OS/2 seller to date, users appear lukewarm to the idea. Applications availability will continue to be the main hitch to OS/2 growth.

• **Don't forget about OS/2 Version 2.0.** A big question mark is the impact of the 32-bit OS/2 2.0, which started shipping in limited quantities in fourth-quarter 1990. Corporate microcomputer managers have repeatedly said they would wait for 2.0.

However, the success of Windows 3.0 has resulted in backpedaling. Volume shipments of OS/2 Version 2.0 are expected by mid-1991, and the industry will be watching to see if multiuser 2.0 is hot enough to light a fire under the users turned on by Windows. Or is it too late?

• **Iron hand at Microsoft?** The success of Windows 3.0 could stir up another hornet's nest if developers grow nervous as Microsoft tightens its grip on operating system and environment software control.

• **What about Next?** Not this year, and maybe not next. □

Keefe is *Computerworld*'s senior editor, PCs and workstations.

Price wars, cheaper storage, safer tubes and more options

BY J. A. SAVAGE

Turboprops and jets both have their places in the sky. One is cheap, flies for short distances economically and offers passengers few amenities. The other works best for long-distance travel and costs more but has movies, headphones and other niceties.

In 1991, personal computers and workstations will be like airplanes: the basic vehicles will stay the same, but the options will grow.

This year watch for the following:

• **PC price wars.** To increasingly challenge IBM and Tandy Corp., firms such as AST Research, Inc. Dell Computer Corp. and Everex Systems, Inc. will drastically cut prices, says William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "There will be a bloody price war," he predicts. And others agree.

Despite that good news for buyers, fewer PCs may actually be sold. In Forrester's recent report, "PCs Meet the Recession," the firm predicted that PC sales will drop from about 6 million in 1990 to about 5.5 million in 1991.

Chipping away

Systems based on Intel's 1486 chip have a long way to go before they can be considered rivals to the 80386- and 386SX-based systems

Number of units sold

	1486	80386	386SX
1989			
Q4	—	159,804	133,694
1990			
Q1	498	136,675	121,798
Q2	2,355	153,418	161,335
Q3	3,702	146,907	197,201

Source: Storeboard, Inc. CW Chart: Doreen St. John

"The recession is causing companies to tighten capital spending," Bluestein says. "PC reins are being tightened in addition to having an already saturated desktop." Sales of Intel Corp. 1486-based models are also expected to be modest.

• **Fewer business computer outlets.** To combat the dreary sales forecast, vendors are aiming PCs at the home market. While the number of outlets for home computers will grow, analysts say the number of outlets for business PCs and workstations will decline. Distributors will be pressed by the shrinking profitability on PCs as their prices decline and by the increased amount of support needed for workstations as they become seen as a more powerful PC alternative.

"Personal computers are grossly overdistributed in the marketplace," says an analyst at Frank Lynn & Associates, Inc. in Chicago.

The resulting margin pressures, the analyst says, have squeezed nearly all profitability from the computer dealer channel and have left "little or no resources" to develop the market for s new technology, such as workstations. Some analysts say they believe these pressures will eliminate several top resellers.

As for hardware advances, Jeff Canin, an independent consultant in San Francisco, says there will be little in the way of new technology. His prediction? "More and cheaper."

• **High-speed, low-cost storage.** The newest peripherals on the scene are redundant arrays of inexpensive disks (RAID). These devices store data quickly and simultaneously on inexpensive 5¼-in. or 3½-in. disks using specialized software and processors.

Compaq Computer Corp. has committed to RAIDs, and Advanced Logic Research, Inc. in Irvine, Calif., is also looking into the technology.

• **Terminals with low electromagnetic radiation levels.** Low-emission VDTs will be available in volume in 1991. Most will come unbundled from small and large companies and will be aimed at s user population increasingly concerned about potential health effects from VDTs' electromagnetic fields.

outlook:
PCs AND WORKSTATIONS

• **Compact discs as a software medium for workstations.** Users will see a push for distribution on compact discs led by Sun Microsystems, Inc. By the end of 1991, Sun will distribute software only on compact disc.

• **No resolution on Unix for workstations.** Users looking for s conciliation between Unix variants for workstations will have to wait, analysts say. A bright spot: The availability of the Open Software Foundation's Release 1 and AT&T's System V Release 4 will mean fewer variants to port. □

All too often, the technology that's allowed you to acquire so much information also dictates how you can use it.

But unless you're free to manage, access and share information the way you want to, you're not getting the most from your information system.

That's where NYNEX® comes in.

Because we're involved in virtually every aspect of the Information Industry, we can give you an unbounded look at the whole picture.

From cellular to software, from hardware to high-speed data highways, from

New hope for storage-hungry sites

BY MAURA J. HARRINGTON

At home, closet storage space seems to get more precious every year. At work, it seems to be the same with data storage.

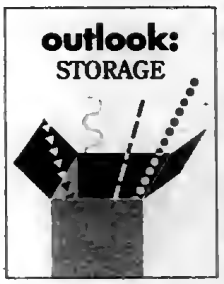
Fortunately, some promising trends await storage-hungry information systems managers in the new year. Here are some of them:

• **Automated tape libaries.** Automated library systems, using both magnetic tape cartridges and optical-disc storage technology, are expected to become more popular in 1991.

Greater interest in automated tape libraries is termed "a significant trend" by Bob Abraham, an analyst at Santa Barbara, Calif.-based Freeman Associates, a market research firm.

The technology is seen as offering a more efficient way to store tapes than the rolling shelving units used in many IS shops.

High-end automated storage systems are especially popular among users "with high volumes of backup," says Hinda Chalew, an analyst in the Computer Storage Service at San Jose, Calif.-based Dataquest, Inc. Automated systems mean cost savings in labor because a person no longer has to switch and store tape cartridges by hand, she explains.



Priced from $216,000 to more than $1 million, the 18-track units can hold as many as 6,000 tapes, or about 1.2 terabytes of data.

One maker of the systems, Storage Technology Corp. in Boulder, Colo., says it has sold more than 2,000 automated tape library systems since 1986. Other manufacturers of similar products include Memorex Telex Corp. in Tulsa, Okla. and Comperex Ltd. in Munich, Germany.

• **Rise of magnetic tape cartridges.** For midrange systems and workstations, the new year will see an increasing popularity of 8mm magnetic, or helical scan, drives. High capacity and a small form factor are likely to lure more users in 1991, analysts say. A single 8mm cassette can hold about 2.3G bytes of data, roughly four times the capacity of a ½-in. tape.

High-end Sparcstations from Sun Microsystems, Inc., high-end VAXs from Digital Equipment Corp. and some Application System/400s from IBM are among the products that now incorporate 8mm magnetic tape drives. Pricing for 8mm drives is about $2.60 per megabyte, averaging about $4,800 to $8,000.

• **Optical will shine.** Several different types of optical-disc drives are due out in volume by mid-year. Designed for DOS, OS/2, Unix and multiplatforms, the drives can access information from more than one operating system without having to change the disc.

Optimem, an Archive Corp. company in Mountain View, Calif., will continue shipping both 12-in. and 5-in. versions of write-once read-many optical-disc drives. Shipments began in December 1990. Prices start at $8,795 for a single drive and $22,800 for a network version.

Other planned introductions of rewritable magneto-optical disc drives are scheduled to come from Ricoh File Products Division in Los Altos, Calif. (prices start at $4,475; shipping is scheduled to begin in the second quarter) and Panasonic Communications & Systems Co.'s Office Automation Group, in Secaucus, N.J. (prices start at $4,500; shipping is set to start in January).

• **Optical jukeboxes.** Also increasing in popularity are optical-disc drive automated storage devices, frequently called jukeboxes. Several companies say they will offer devices in early 1991 with a capacities exceeding 650M bytes, providing the equivalent of daisy-chained magnetic drives for optical discs.

Among the notable offerings will be the $8,000 Desktop Robotic Library from Apunix Computer Systems in San Diego, a Ricoh product adapted for use with Sun systems. Sony Corp. and NEC Corp. in Japan, Toshiba America Information Systems, Inc.'s Disk Products Division and Pioneer Communications of America, Inc. are also among those planning to ship jukeboxes this year.

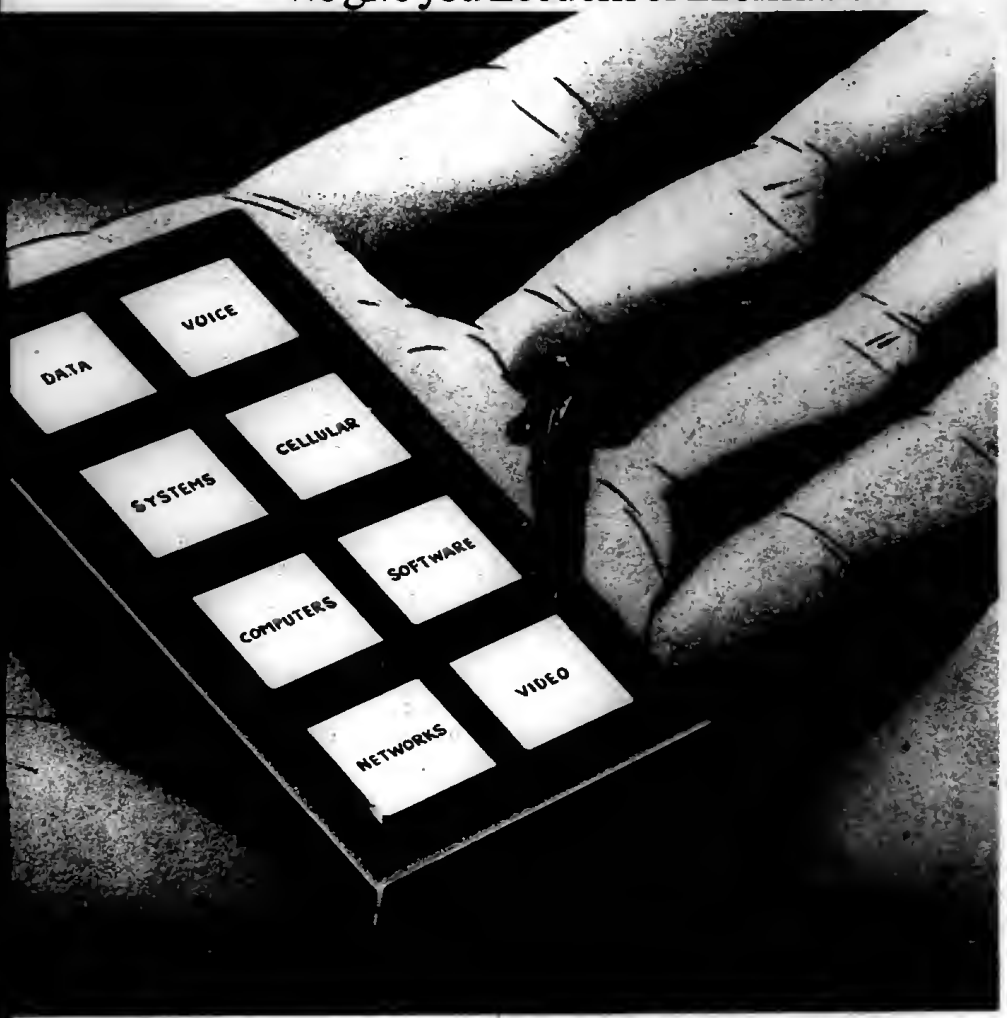
Unit shipments of all types of optical-disc systems will in some cases triple by 1993, according to Disk/Trend, Inc. optical analyst Bob Katzive. Sales of optical-disc drives will reach approximately 5 million units during the next two years.

Even so, it will take nearly a decade before optical- disc drives become an alternative to magnetic tape drives, notes Jim Porter, publisher of "Disk/Trend, Inc.," a trade publication based in Los Altos, Calif.

Still needed is an industrywide optical disc drive standard, along with better speed and reliability, Porter says. □

Harrington is a *Computerworld* West Coast correspondent.

We give you freedom of information.



token rings to teleconferencing, from video to voice recognition, we offer the kind of freedom of choice in solutions that can really free up your information.

That's why scores of businesses, institutions and governments around the world have come to depend on NYNEX for their information needs. Call us at 1 800 535-1535. For solutions that will set you free.

Need to communicate? Need to compute? The answer is

NYNEX

Computerworld

Providing serious information
for serious readers

1991 Editorial Calendar
(January-June)

Executive Reports	Issue Date	Ad Closings	
		Color	B/W
Maximizing the I/S Investment: Laying the Groundwork for New Architectures	Jan. 7	Dec. 20	Dec. 28
Taming the Unmanageable Network	Jan. 21	Jan. 4	Jan. 11
How I/S and Individual Business Units are Negotiating Project Priorities	Feb. 18	Feb. 1	Feb. 8
How Large Companies are Creating Data Standardization	Mar. 4	Feb. 15	Feb. 22
Maximizing the I/S Investment: Evaluating Advanced Technologies	Mar. 18	Mar. 1	Mar. 8
The I/S Role in Workforce Education	Apr. 15	Mar. 29	Apr. 5
View from the Top: How CEOs and CFOs Evaluate I/S	Apr. 29	Apr. 12	Apr. 19
Maximizing the I/S Investment: Data Center Efficiency	May 13	Apr. 26	May 3
Striking the Right Balance Between Centralization and Decentralization	June 17	May 31	June 7
Product Spotlights/Buyers' Scorecards			
High-end Modems	Jan. 14	Dec. 28	Jan. 4
Network Connectors - Gateways, Bridges and Routers *(Featuring Buyers' Scorecard)*	Jan. 28	Jan. 11	Jan. 18
Systems for Flexible Manufacturing	Feb. 11	Jan. 25	Feb. 1
Relational Databases *(Featuring Buyers' Scorecard)*	Feb. 25	Feb. 8	Feb. 15
Project Management Software	Mar. 11	Feb. 22	Mar. 1
Software Maintenance Tools *(Featuring Buyers' Scorecard)*	Mar. 25	Mar. 8	Mar. 15
Sales Force Automation	Apr. 8	Mar. 22	Mar. 29
CASE Tools *(Featuring Buyers' Scorecard)*	Apr. 22	Apr. 5	Apr. 12
LAN Servers	May 6	Apr. 19	Apr. 26
Network Management *(Featuring Buyers' Scorecard)*	May 27	May 10	May 17
Minicomputers	June 10	May 24	May 31
Portables and Laptops *(Featuring Buyers' Scorecard)*	June 24	June 7	June 14
Integration Strategies			
Using Commercial Systems Integrators	Feb. 4	Jan. 18	Jan. 25
How Companies are Effectively Incorporating LANs into the Integration Strategy	Apr. 1	Mar. 15	Mar. 22
Strategic Integration of Databases	June 3	May 17	May 24
Industry Closeups			
Industry Closeup: Information Systems in Medical Care	Feb. 4	Jan. 18	Jan. 25
Industry Closeup: Information Systems in Transportation	Apr. 1	Mar. 15	Mar. 22
Industry Closeup: Information Systems in Energy Production	June 3	May 17	May 24
Special Reports			
Special Report: Advances on the PC Front	May 20	May 3	May 10

COMPUTERWORLD

Faster than a speeding . . .

. . . well, not really. Unix will plod along in 1991 gaining favor with IS slowly but surely

BY JOHANNA AMBROSIO

If Unix had a superhero, he'd probably spend most of 1991 in a telephone booth trying to figure out how to put on his cape.

And so it will be in the commercial Unix market this year. As vendors continue to bring out new systems and software incorporating different bells and whistles, such as fancy graphical interfaces and integration with non-Unix systems, the majority of the users they are trying to woo will mostly continue to turn deaf ears to it all.

Yes, Unix will grow in the commercial sector but slowly. "There will be gradual, almost glacial movement," says Kevin O'Neill, vice president at the Business Research Group in Boston. "Unix still suffers from the 'ugly duckling' syndrome of being difficult to use and hard to learn."

Even in the area in which Unix may make the most progress this year — as a platform for client/server computing — it still lags behind other operating systems.

In an August 1990 survey done by the Business Research Group, only 12% of the 502 respondents said they would consider using Unix in a client/server environment. DOS garnered a 48% share, and even OS/2 got 25%. Unix may grab some of that OS/2 share, however, if users decide that Unix is a less risky decision, or a less expensive one, than OS/2.

Richard McGuire

Still, Unix growth will continue to be held back by two familiar problems: the lack of applications software and the existence of two major Unix versions.

While a large number of vendors, including Lotus Development Corp. and Ashton-Tate Corp., will ship more Unix versions of DOS software, it will take at least another year for the applications problem to be solved.

AT&T's Unix System V and the Open Software Foundation's OSF/1 will fight it out for market share, although products incorporating OSF/1 will not likely ship in volume until late in 1991 at the earliest. It will be another year before OSF/1 garners any significant following.

Now here's a bit of good news. Although the so-called Unix wars may result in users steering away from Unix until a winner is eventually decided on, the fact that both versions exist will probably benefit users in the long run.

"OSF/1 forced AT&T to modernize and modularize its operating system," says Judith Hurwitz, vice president at Patricia Seybold's Office Computing Group in Boston.

Then, too, Unix will help create a more receptive IS environment for the idea of open systems, although Unix may not be a recipient of this consciousness-raising. IBM and Digital Equipment Corp. are incorporating the ideas behind Unix — interoperability and applications portability — into their operating systems.

But whether Unix is even ready for prime time is in dispute. Both System V and OSF/1 will have high-level security and transaction processing features as well as other measures of a full-featured operating system by the time new versions ship in 1991.

"It is not prudent to put mission-critical applications on Unix," says Peter Schay, vice president at Gartner Group, Inc. in Stamford, Conn. However, he adds, "by 1993, there's a high probability it will be practical to do so."

Rikki Kirzner, senior industry analyst at Dataquest, Inc. in San Jose, Calif., strongly disagrees. "He's dead wrong. By the first half of [1991], there will be at least five fault-tolerant Unix vendors. Three will have security graded B2 or higher, and up to 18 will have disk-mirroring capabilities in Unix." Still, she says, the "IS component of the Unix market will grow the slowest."

Just like with superheroes, there are some things you can count on — and the continued torpid movement of Unix will be one of them. □

Ambrosio is *Computerworld's* Mid-Atlantic senior correspondent.

Taking Summit to a place no starship has gone before

BY JEAN S. BOZMAN

These are the voyages of the starship Summit. Its five-year mission: To defend space territory for the home planet, I-Beam, staving off the warships of the Plug-compatibles, the Digital Strivers, the dual-hulled Tandem vessels — and the growing legions from the planet Unix. The starship's captain plans to take the Summit where no vessel has gone before — to the outer edges of the User universe.

SCENE: *On the bridge of the Summit. Captain Pickard is anxious to leave.*

CAPTAIN: We paid several million dollars for the new Summit engines, didn't we, Georgy?

ENGINEER: Yes, captain, we did.

CAPTAIN: Then where are they?

ENGINEER: We have our old "J" engines, which have been upgraded. But we really shouldn't leave for the Far Sectors until the new ones are installed, which should be sometime in late 1991.

CAPTAIN: If we wait, we'll miss our scheduled rendezvous with the Klangons. They say they have a very important message for me. The entire future of the universe, as we know it, may depend on that meeting.

ENGINEER: Well then, we'll push off tomorrow with our souped-up Foothill models. They're quite good, really, except when the water-cooled panels spring a leak. But that only happens once every few light-years or so. I only have one other problem: I can't decide how to pay for the fuel in the warp-drive tanks.

CAPTAIN: No problem, Georgy. Connect the Summit communications ports to the I-Beam electronic funds exchange network on planet Earth. The money will be automatically deducted. Now, hand me that road map, First Officer Daton.

DATON, *a sophisticated computer (make that android), speaks up*: It's curious, Captain, but I can't find our destination on this map I bought at the I-Beam travel headquarters.

CAPTAIN: Don't worry, they'll patch us into the universal videoconference network when we're nearly there and beam us the destination coordinates. Carry on.

SCENE: *Nine months later, aboard the Summit, which is nearing the Far Sectors. Communications officer O-Hear-a is receiving a transgalactic message. The Klangon ships are dead ahead, but they're surrounded by dozens of other spaceships.*

CAPTAIN *(looking at shuttlecraft headed for a greenish planet)*: So that's the source of all the Unix code I've seen flashing around the universe.

The radio squeals.

KLANGON CAPTAIN: Commander Spacek here. Captain Pickard, I understand you're working with fiber-optic photons these days. Very effective at pushing your own Summit data to the farthest reaches of the universe. But you shouldn't even try to fight us. You've been keeping us out of your way all these years. But I'll bet you don't have the backbone to transport any Unix delegates on board.

Lewis Zinck

CAPTAIN: I already have one or two Unix delegates on board, but I won't let them anywhere near my Summit engines — unless, of course, my government demands that I do so.

KLANGON CAPTAIN: Ha! Too late! Looks like you're surrounded, Pickard!

The star-strewn view outside the Summit window is full of hundreds of spacecrafts, all very different in appearance. Data and voice communications are, indeed, being interchanged. "Do they know something I don't?" Pickard wonders.

He quickly orders engineering to reverse the thrust on the Summit warp drives and return to I-Beam.

CAPTAIN: We'll return to fight again! You'll see.

Next week: Headquarters speaks! □

Goodbye 1990

Buyer favorites of 1990

Networking management software ..... *Feb. 5*
Systems Center's Netmaster
Best feature: Internal integration

SQL relational DBMS ..... *March 5*
Sybase
Best feature: Effective user-defined integrity

Front-end CASE packages ..... *April 9*
Knowledgeware's IEW Analysis and Design
Best feature: Range of functions

General ledger software ..... *May 7*
Global Software's GL
Best feature: Meeting current business needs

Mainframe access control software ..... *June 11*
Computer Associates CA-ACF2
Best feature: Audit trail functions

Executive information systems ..... *July 16*
Pilot's Command Center
Best feature: Ease of screen design and maintenance

Triple-density direct-access storage devices
Amdahl's 6380-K ..... *Aug. 13*
Best feature: Hardware compatibility

Mainframes ..... *Sept. 17*
Amdahl's 5890 300E
Best feature: Reliability

Minicomputers ..... *Sept. 24*
Hewlett-Packard's HP 3000 Model 925
Best feature: Availability

Real-time MVS performance monitors ... *Oct. 8*
Landmark Systems' The Monitor
Best feature: Effective on-line real-time reporting

Personal computers ..... *Nov. 12*
Hewlett-Packard's Vectra 386
Best feature: Reliability

T1 multiplexers ..... *Dec. 3*
Stratacom's IPX series
Best feature: Reliability

The best books

The following is a list of the best books reviewed by *Computerworld* in 1990. The books are listed in no particular order.

Why Leaders Can't Lead: The Unconscious Conspiracy Continues. By Warren Bennis (Jossey-Bass Publishers). From our review by Amiel Kornel: "For information systems professionals searching for a way to influence the direction of their organizations, Bennis can serve as a guide."

Computerizing the Corporation. By Vicki McConnell and Karl Koch (Van Nostrand Reinhold). From our review by Michael Fitzgerald: "The authors feel it is a trap to believe that just computerizing will make a company better. Instead, they say that companies must use technology to make employees work better."

The Intelligent Corporation: Creating a Shared Network for Information and Profit. By Ruth Stanat (Amacom Books). From our review by Joanie M. Wexler: "As a framework for thinking, the book delineates the financial, political and cultural issues companies must consider as they embark on a systematic approach to information gathering, sharing and maintenance."

Total Customer Service. By William H. Davidow and Bro Uttal (Harper & Row). From our review by Maryfran Johnson: "The authors succeed in taking a cliched yawner of a topic — who isn't out there declaring this the year, the decade or the millennium of the customer? — and making it zing with juicy anecdotes about famous companies."

Silicon Dreams. By Robert W. Lucky (St. Martin's Press). From our review by Donald St. John: "Lucky's gift is his ability to define a hierarchy of concepts and then examine the problem of processing information at each level."

The Improbable Machine. By Jeremy Campbell (Simon & Schuster, Inc.). From our review by Christopher Lindquist: "Campbell is very adept at reducing some very complex ideas into terms and examples that make the material much less of a chore than might first be assumed."

Father, Son & Co.: My Life at IBM and Beyond. By Thomas Watson Jr. (Bantam Books). From our review by Glenn Rifkin: "The book is a must read, offering an intriguing look inside one of the best known father/son relationships in history."

Influence Without Authority. By Allan R. Cohen and David L. Bradford (John Wiley & Sons). From our review by Carol Hildebrand: "The book is a realistic and engaging look at how to get things done when you don't necessarily have the authority to just say, 'Do it.' "

Breakthrough Thinking. By Gerald Nadler and Shozo Hibino (Prima Publishing). From our review by Joanne Kelleher: "Jump in at Chapter One and resist any urge to scoff or jeer as the authors talk about problems as opportunities, because by the end, you'll remember your initial cynicism with embarrassment."

Currents of Death: Power Lines, Computer Terminals, and the Attempt to Cover Up Their Threat to Your Health. By Paul Brodeur (Simon & Schuster). From our review by J. A. Savage: "Although the subject matter is technical, don't mistake it for dull."

G-Forces: The 35 Global Forces Restructuring Our Future. By Frank Feather (William Morrow and Co.). From our review by Joseph Maglitta: "What makes Feather different — and relevant for IS readers — is his ability to credibly tie technology into a wider, longer view of world development." □

Moving around

Never ones to shy away from opportunity, a large number of high-profile information systems executives switched jobs during the last year

IS Executive	Left	Joined
Stefan Gladysiewski	General Signal	EMI Music
Michael Hershal*	Baxter International	Security Pacific
James Kinney	General Foods USA	Carlson Companies
Allan Loren	Apple	Covia
Charles Mayer	Tech Partners	First Boston
Michael Simmons	Bank of America	Bank of Boston
Martin Stein	Paine Webber	Bank of America

**Resigned from Security Pacific in November after a seven-month stay*

IN MEMORIAM

An Wang, 70
Founder, Wang Laboratories, Inc.
March 24

Robert Noyce, 62
CEO, Semtech Co.
June 3

Gary J. Biddle, 52
Vice president of information systems technology, American Standard, Inc.
Sept. 26

J. William Mullen, 42
President, National Computer Measurement Group, and consultant, BGS Systems, Inc.
Oct. 23

William M. Walsh, 54
Executive vice president, New York Clearing House Association
Nov. 10

Mary Jo Moccia, 55
Senior vice president, Midwest Stock Exchange
Nov. 16

Burton S. Golberg, 62
Former head of IBM's Large Systems Division and developer of IBM System 360 and System 370
Nov. 25

EDITORIAL

Backward glance

IN CASE YOU have forgotten, it was a pretty busy year, one that set the stage for an even more interesting 1991.

Jan. 8 — A state court in New York overturns what would have been the toughest VDT safety law in the country. Several other states will test similar laws throughout the year, but the VDT safety issue remains murky at best.

Jan. 22 — AT&T's vaunted long-distance service goes on the fritz for nine hours. The culprit is a software bug, but the incident raises legitimate concerns about the viability of the nation's communications links.

March 12 — Bitter long-term rivals MSA and McCormack & Dodge are "united" in a merger made by Dun & Bradstreet. By year's end, the company defies the naysayers and manages to hold the units together reasonably well, promising a sort of "year of the customer" in 1991.

April 2 — Wang Labs founder An Wang dies of cancer, his firm run aground by runaway expenses and misspent strategies. But new helmsman Rick Miller manages to make at least a little headway by the end of the year, while customer confidence remains implacably high.

May 7 — Ashton-Tate head Ed Esber steps down as the company ails. Seven months later, a judge removes copyright protection from Dbase, the company's flagship product. Uh-oh.

July 30 — DEC begins what will be a continuous effort to pare costs, starting with a rich early retirement offer in the summer and finishing the year amid rumors of unceremonious layoffs looming in 1991. The company experiences shipping delays for its VAX 9000 mainframe and, in December, reveals significant technical flaws that result in a sort of recall of the machine.

Aug. 20 — *Computerworld* leaks details of IBM's coming megamainframe announcement. Coupled with a midrange realignment and a vitalized personal computer and workstation strategy, IBM enters 1991 as one of the few bright hardware lights, even though its software efforts continue to falter.

Sept. 24 — High-flying Oracle is brought down to earth by the weight of sagging profits. Founder Larry Ellison radically recentralizes the formerly decentralized giant and vows reform to users.

Oct. 29 — A rapidly sinking Unisys announces a $350 million quarterly loss to cover the layoffs of 5,000 workers. Michael Blumenthal steps down as chairman while the firm's market value falls below $600 million, a far cry from the $10 billion of two years ago.

Dec. 3 — After lurking in the dark for months, recessionary fears come to the fore in the form of slashed information systems budgets for 1991. IS think tanks call for companies to re-engineer themselves with technology, but there's precious little money set aside to do so.

Dec. 10 — The bombshell of the year comes as AT&T launches a hostile takeover attempt of NCR, the last of the BUNCH companies. NCR resists, and the stage is set for a protracted and bloody battle spilling into 1991.

LETTERS TO THE EDITOR

Where's CTOS?

Computerworld gives only slight coverage to the CTOS/BTOS operating system and environment. It is the third most popular desktop system in the country, behind the personal computers and Macintoshes. Why have I not seen more coverage in *Computerworld* and other publications based on covering the broad market?

CTOS and the updated CTOS/VM already have many, if not most, of the current hot topics and features such as the following:

- Full protected-mode operation on the Intel 80286, 80386 and I486 processor line.
- Local-area networking inside the operating system.
- Wide-area networks to connect several widely distributed CTOS networks as well as Transmission Control Protocol/Internet Protocol networks.
- Multitasking also built-in from the beginning.

David K. McClanahan
Oak Ridge Operations
Oak Ridge, Tenn.

Ageless OOP

As a proponent and user of object-oriented programming (OOP) languages, I am pleased to see the increasing acceptance of the object-oriented methodology in major companies as shown in "IBM on object-oriented path" [CW, Nov. 5]. However, it disturbs me to see OOP languages described as "radically different from today's software development procedures," when nothing could be further from the truth. The extension of both C and Pascal to support OOP has provided a familiar environment in which traditional programmers can explore and fully exploit the three planks of object-oriented programming. While it is true that Smalltalk (the original object-oriented language) seems quite different due to its lack of procedural constructs and its syntax, it will never be a mainstream language for precisely these reasons. I suspect that many writers mistakenly equate OOP with Smalltalk, and this is the source of the assertions such as the one above.

The penetration of OOP into traditional systems development will only become significant when users see it as evolution of existing methodologies and languages rather than a revolutionary change. You would be doing the industry a service by casting OOP in a more realistic light.

Nick Redding
Redding Computer & Communications Systems Consulting, Inc.
Nepean, Ont., Canada

User rights

Patricia Keefe's commentary "Users come first, right?" [CW, Dec. 10] hits the proverbial nail on the head with a 16-pound sledgehammer.

Having worked both sides of the fence as a user, software support representative and now as IS manager, I am painfully aware of the trend some companies are following.

My application vendor (who shall remain nameless) recently tried to get me and the rest of the installed users to cough up roughly $40,000 each for some "PC-like" bells and whistles, some to be delivered "soon" and the balance to be delivered in mid-1991. None of this new application "enhancement" was running on any customer machines that I know of, even in an "alpha" state.

I think there was some genuine interest in trying to provide the user with improved features, but the overriding message was that a cash infusion was needed but quick, so let's get the dough and worry about delivery later — let alone product quality.

Charles Simpson
IS Manager
3D Systems, Inc.
Valencia, Calif.

New image

I thought the most insightful statement in your special report on imaging technology [CW, Nov. 5] was on the order of: "In many situations, it's the information, not the document, that needs to be captured." Several years from now, we may expect a new wave of technology that offers to extract information from the millions of images that reside on compact discs. Some people may think images are all they will ever need. Such people should be especially careful that their long-range vision isn't obscured by the smoke of today's marketing.

John W. Krieger
Westinghouse
Savannah River Co.
Aiken, S.C.

C++ explained

Mr. Murray's letter, "C++ = Hype" [CW, Nov. 12], is an example of those who do not have an understanding of C++ and object-oriented programming coming to incorrect conclusions about a welcome advance to C

Dear Santa: Regarding the gifts you forgot . . .

MICHAEL COHN

Now that all of the Christmas presents have been opened, the computer users on your list may find that they didn't get the gifts they *really* wanted. Here are a few suggestions to help you get started on next year's holiday shopping.

The Desktop Computer Halon Fire Prevention Kit. Show them you care with the perfect personalized safety system. Ideal for that security-conscious end user or for anyone who likes to smoke after a batch job. Extinguishes electrical fires in seconds — as well as any mammal within 30 feet.

Commuter's "Office in a Briefcase." Give the gift that turns a car into a productivity center! The leather-bound "Office in a Briefcase" fits easily in the passenger seat and contains a personal computer, copier, cellular telephone, answering machine, facsimile machine and letter-quality printer. Just plug it into the cigarette lighter and stay busy during the worst rush hour. Your career can move ahead even if you're standing still, which will happen pretty often, because the unit sucks your car battery dry in about eight seconds.

1991 Project Calendar. At last! A calendar specifically designed for information systems project management. A separate, easy-to-read page for all 14 months in 1991.

The Disk Compactor. Stop throwing away old 5¼-in. floppies! Just load twelve at a time into this attractive, wood-grain-finish deskside Disk Compactor. In seconds, they're compressed into a single, nearly usable 3½-in. disk!

The Disk Compactor practically pays for itself, comes with a full-year warranty and may occasionally generate tremendous heat and pressure. Recommended for use with the Desktop Computer Halon Fire Prevention Kit.

The Keyboardless Display. This portable display is just two inches thick and needs no keyboard, mouse or lightpen! It comes with two knobs: one that draws up and down and another that draws left and right. All units are Christmas red and come standard with TIO-SI (Turn It Over and Shake It) for screen refresh.

Mainframe-of-the-Month Club. Own your own water-cooled processor! Put one in the den for the kids! It's affordable because it's shipped to you piece by piece. Examine the first component for 10 days. If you decide to keep it, a new piece will be sent to you about every month. Cancel at any time, or collect the whole set for hours of fun and multiprocessing. Some assembly required.

Hacker Zap. What better way to say you care than to protect the data of the ones you love. Hacker Zap inconspicuously attaches to any computer keyboard and comes with its own "secret password." Just wait until someone tries to sign on without it. Zap! Twenty thousand volts makes any perpetrator think twice.

Available at fine stores where computer products or weaponry are sold, except where prohibited by law.

Shetland Wool "On Call" Hiking Sweater. For the rugged IS outdoorsman or just for "keeping in touch" on that next camping trip. Waterproof side pouch keeps important disks safe and dry while the clear plastic pager pocket displays digital readout in any weather.

Available in either cable gray or raised-floor white. Little clips for your mittens are optional.

Necktie Template. Draw perfect flowcharts and look good at the same time. Why fumble for a hard-to-find template when all the essential processing symbols could be hanging just a few inches above your navel?

Made of soft, durable plastic with the look and feel of expensive polyester.

The Combination Decorative Holiday Wreath and Tape Protector Ring. A festive addition to your reel-to-reel tape library. Also available with the Tape Drive Cleaning Kit for removing those pesky stray pine needles.

The Complete IS Professional's Audio Library. Now your favorite manuals and macros are as close as the nearest tape player. This is the entire collection of most-loved computer classics, captured on 40 easy-listening cassettes.

Imagine the hours of enjoyment you'll experience as you catch up on *The Cobol Manual* or *The Microsoft C Compiler Runtime Library Reference*. Perfect for downtime, commute time or just for those quiet evenings at home.

Cohn is trying to be a computer salesman in Atlanta.

programming.

Murray correctly points out that function prototyping is in ANSI C but doesn't understand that ANSI C got function prototyping from C++, not vice versa. C++ adds strong type checking to C — a welcome improvement. Prototyping is only one part of C++'s type-checking features.

Murray seems to believe that C++ compilers are unable to correctly identify which function is to be called based on the type of parameters passed to the function. If a compiler can correctly determine the type of parameters passed to a function (i.e., function prototyping), finding the correct function to call via the parameters is not difficult and is a very nice feature.

While these concepts may have been around for 30 years, C++ provides both designers and programmers with a tool to implement reliable, readable and maintainable systems.

Ken Avellino
Senior Programmer/Analyst
The Church of Jesus Christ of Latter-Day Saints
Salt Lake City, Utah

Staying inside

The article "How IBM, Perot lost out" [CW, Nov. 19] makes me wonder why Navistar International does not receive a special award for perception and wisdom. In today's world, where fools unknowingly step into the spider's web by outsourcing, it is refreshing to see a company do the opposite.

In my years of consulting and guiding people through the throes of carefully investigating outsourcing, the contracts and the *real* implications, I have rarely seen it function as a success.

In most cases, a naive and acquiescing top level of management is courted by the outsourcing company into a contract that, in effect, "gives away the farm." But since the onerous contract was signed by top management, one must essentially walk on eggs to survive the contractual terms and force the outsourcing company to follow even the most rudimentary terms of the contract.

A trillion kudos for Navistar — it is indeed the astute of the astute.

Richard A. Katzman
New Cumberland, Pa.

C++, yea!

In a recent letter to the editor, Jim Murray registered several complaints about the C++ language [CW, Nov. 12]. From his letter, it is clear that not only does Mr. Murray not know C++, but he's also not familiar with the basic concepts of object-oriented programming.

True, it was a mistake for *Computerworld* to claim that function prototyping is a "vital improvement" when such prototyping is also available from ANSI C. However, Mr. Murray goes on to say, "It is also stated that 'overloaded' function prototypes are allowed. I can have two functions with the same name, and the compiler will choose the 'right' one. That doesn't give me a warm feeling." Then neither must the notion of encapsulation: Why should the user of a function or method have to know how that function or method is implemented?

However, I agree with Mr. Murray's final statement. Good programs are designed (and implemented) by good programmers; the advantages of object-oriented programming in general — and C++ in particular — help to promote the reuse of those good programs, increasing the chance that the benefits of those good programmers' efforts will be enjoyed for years to come.

Rick Genter
Useful Software
Pepperell, Mass.

The lines are open

Computerworld's article "The Viability of Telecommuting in IS" [CW, Nov. 26] overstates the benefits of physical closeness to teamwork. During three years managing as a full-time telecommuter, I enjoyed better productivity and all the other benefits mentioned. I like to work with people face-to-face, but I'm convinced that teamwork depends on where people's heads are at, not where their bodies sit.

It *is* very helpful for people to have face-to-face contact with each other in the early stages of forming a telecommuting team. From time to time, that contact needs to be refreshed. But for weeks and months at a time, physical contact is unnecessary and may even be counterproductive. It's often a crutch.

Today, many telecommute a few days each week. They often put off things they feel would be better handled face-to-face. If they were not so close to the next opportunity for face-to-face contact, they would give some thought to handling things remotely. Many situations would then be resolved in a more timely and correct fashion.

Arnold B. Krueger
VM Technology Associates
Grosse Pointe Woods, Mich.

Fitting the mold

Regarding the commentary of Ms. Vivian Wilson [CW, Nov. 19], she is absolutely right — opportunities for blacks in data processing were never good and are only getting worse. Back 15 years ago, even 10 years ago, employers had no preconceived notion of what a programmer should look like, so they didn't have a template of a young white male (don't forget the wedding ring) against which to compare and reject candidates. Now, the industry has "matured" and regressed. Employers now have a better picture in their mind of what a data processing professional looks like. Lots of luck to anyone who doesn't "look" right.

Marianne G.C. Seggerman
Stamford, Conn.

Too fickle

As an Application System/400 user who purchased an AS/400 from an industry remarketer, I am appalled at the way IBM is handling the distribution of Release 3.0.

I have requested an early issue of Release 3.0. IBM has informed me that the software was not registered, although my remarketer has told me it was.

IBM is doing a lot of squabbling with its independent remarketers lately. I do not care who is at fault. All I want is Release 3.0.

IBM has no right to change support policies on a product it has already sold. When speaking with IBM, I was told there may be a 12% charge on the software for continued support. Twelve percent for what, Mr. Akers? What benefit will be reaped?

Philip Zaczek
Vice President of Information Systems
Allied American Insurance Co.
Park Ridge, Ill.

Unintended humor

I like reading humor in *Computerworld*, but I never thought I'd see it on the op-ed page in the form of an editorial by Massachusetts Gov. Michael Dukakis [CW, Dec. 10]. Why do you think we call the state Tax-achusetts? Your state has many high-tech firms that would like to attract high-tech workers like myself. But I'd never willingly move to such a soak-the-rich, high-tax state. Dukakis' policies didn't do much for your state, did they?

David Appel
Indianapolis, Ind.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

There's no end to how far people will go to get COMPUTERWORLD first.

Whether you're fishing for the hottest news in the computer industry or trying to reel in a new job, there's only one place to start: the pages of *Computerworld*.

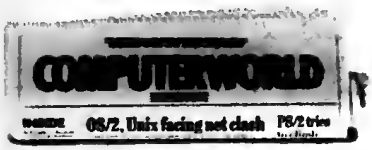
But there's no need to go to extremes just to be among the first in your company to find out about topics ranging from products and people to trends and technology.

Simply subscribe to *Computerworld* today and you'll receive 51 issues packed cover to cover with everything you need to know to get to the top and stay there.

Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

Don't miss the boat. Use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld* — the best-read publication in the industry.

You'll be so far ahead of the competition, you may even have time for a little fishing.



The Newsweekly of Information Systems Management

Officevision 2 delay; no release date given

BY ROSEMARY HAMILTON
CW STAFF

Saying it underestimated the task of developing a strategic office platform, IBM executives last month confirmed the second major delay of Officevision.

IBM said it intends to provide a status report on the delayed Officevision releases in the second quarter of 1991, according to Joseph Guglielmi, an IBM vice president and president of the Applications Solution Division.

"I don't like it, I don't want to be here, but we are here, and I have every confidence we will get this done," Guglielmi said.

As it stands today, Release 2 of Officevision/LAN series, which was scheduled to be out by the end of 1990, will be delivered at an unspecified future date.

Also, the OS/2 direct connect feature for all three host versions of Officevision is delayed. Previously, this feature was scheduled to ship with Release 2 for the host platforms, targeted for delivery in the fourth quarter of 1990 and early in 1991.

IBM's Guglielmi *says customers still want Officevision*

Guglielmi said the OS/2 direct connect may or may not be synchronized with the delivery of Release 2 for hosts. For instance, a Release 2 for MVS customers was delivered this fall without the direct connect feature.

"So they are putting us on hold until June," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass. "That's amazing. They've got to realize that Officevision is in some severe trouble today."

However, recent interviews with customers suggested that much of the Officevision user base is slowly implementing the product and, as a result, is not pushing IBM to deliver more quickly.

For instance, two MVS customers contacted said they did not care about IBM's delay in delivering the OS/2 direct connect feature, because they have yet to even install OS/2.

Both Guglielmi and Tony Mondello, IBM's vice president of office systems development who has direct responsibility for Officevision, acknowledged that they have their hands full but said that they expect to bounce back from these delays.

"I believe we will weather this with some difficulty, clearly, because there will be some disappointed people," Guglielmi explained, adding: "It is well known that we bit off a lot. But the customers want this. We are fully committed to this, and we are not going to blink."

Today's offering

In May 1989, IBM said it would deliver a second release of Officevision, which came to be known as the "real Officevision" in the industry because of its key features, throughout 1990.

However, the following is what is available today:

- Release 1 and 1.1 of Officevision/LAN series is shipping. Some new features, including additional MS-DOS support, will be added to Release 1.1 by March. A half-price deal is in effect for Release 1.1, and it can be licensed for $375 instead of $750.
- Release 2 of Officevision/MVS is shipping, but it is not Release 2 as originally described. It contains some new office functions and performance tuning. The OS/2 direct connect feature is not available.
- Release 1 of Officevision/VM is available, and a maintenance update was shipped quietly in the fall. Release 2, which may or may not ship with the OS/2 direct connect, is delayed.
- Officevision for the Application System/400 operates with different release numbers. The first Officevision went out as Release 2, and an update, called Release 3, is currently available. It does not have the OS/2 direct connect feature.

Systemview not catching user fancy

BY JOHANNA AMBROSIO
CW STAFF

ORLANDO, Fla. — At this point, IBM's Systemview architecture is not of immediate concern to most users. This became apparent at a conference in December, during which the subject was discussed and dismissed by users.

"All IBM shops will have to move to it someday, but right now, it's not even real," said James D. Galway, a staff member at the state of Utah's Division of Data Processing in Salt Lake City. "It's more a direction than anything else."

Most attendees at the Computer Measurement Group conference agreed that Systemview is a strategic ball to keep in the air for the future, but it is not on their immediate to-do lists. Instead, attendees said they are more concerned about the complex tasks of performance measurement, bottleneck diagnosis and software tuning.

Aubrey Chernick, chairman and chief executive officer at Candle Corp. in Los Angeles, said a new discipline will likely arise over the next few years to take care of these tasks. Called enterprise performance management, the idea will be to diagnose and fix problems that can occur anywhere in the network.

Complicating life for most performance specialists, Chernick said, are the increasing complexities of technology. Not only are individual technologies such as mainframes becoming more complex, but there are also many more performance interdependencies.

In addition, Chernick said, there are more different kinds of work loads sharing the same resources. "You can look at all of them, but even knowing where to start will be a major problem." He said a new kind of technician, called an enterprise performance engineer, will be able to supplement specialists' roles by knowing how a variety of technologies work together.

Simple approach

In keeping with the theme of trying to simplify performance management, several vendors announced products with easy-to-use interfaces that aim to provide "single-console" management of different systems. Users no longer have to log onto different monitors and learn various packages to know what is going on, they said.

Most vendors also said their products are consistent with the Systemview architecture announced by IBM in September.

Among the products introduced at the show were the following:

- Goal Systems International, Inc. in Columbus, Ohio, unveiled two new packages: Preview for DB2, which predicts DB2 performance, and In2itive for DB2, which analyzes DB2 performance. Both are based on expert systems technology.
- BGS Systems, Inc. in Waltham, Mass., announced BEST/1-DASD Consultant for MVS performance reporting, tuning and capacity planning. The company also introduced the Batch Support Facility for planning and managing batch jobs running under MVS.
- New releases of Mainview came from Boole & Babbage, Inc. in Sunnyvale, Calif. Among the improvements to its performance management packages is a friendlier user interface that offers improved access to more detailed information.
- Computer Associates International, Inc. in Garden City, N.Y., introduced Release 7.0 of CA-PMA/Look. The on-line monitoring tool sports a user interface that follows IBM's Common User Access (CUA) guidelines.
- Version 500 of Omegamon for CICS, which now adheres to IBM's CUA and supports color, and Version 3.3 of ISM/CP Base from The Information Systems Manager, Inc. in Bethlehem, Pa., which offers improved PR/SM support.

NAPERSOFT

NAPERSOFT, Inc.
One Energy Center
Naperville, IL 60563-8466
708/420-1515

Treats Customers Write

NAPERSOFT® Automated Correspondence Software handles your written communications to customers quickly, accurately and professionally with:

- On-line or batch letter writing
- On-line notepads
- Spell checker
- On-line letter history
- Full function word processor
- Full printer support

With your IBM mainframe and NAPERSOFT software you can streamline your customers correspondence! NAPERSOFT... for businesses that treat customers write.

FIRST CLASS SERVICE

IBM move irks AS/400 users

BY MARYFRAN JOHNSON
CW STAFF

IBM was looking a lot like Scrooge recently to some of its small business Application System/400 customers, who recently became "orphan accounts" when IBM severed its contracts with certain industry remarketers.

These customers, who bought their AS/400 hardware and software from IBM-authorized third-party vendors, are facing what they consider to be a special punishment now that their remarketers' contracts have expired. They must pay a 12% licensing fee on their current operating system software to obtain new releases of the OS/400 operating system and the software support formerly provided by resellers such as Atlanta-based Sun Data, Inc. and XL/Datacomp, Inc. in Hinsdale, Ill.

"I don't guess I've got much choice but to pay this 12%, but I'm sure going to scream and holler about it," said Frank Nestor, director of data processing at Summit Consulting, Inc. in Lakeland, Fla. "I bought and paid for this software, and while I did get a discount, now IBM wants 12% more."

IBM responded last month to the customer complaints with a prepared statement that the 12% charge is a "transition fee . . . to help defray costs for IBM to provide program services." It will be levied only on AS/400 customers whose remarketers have been dropped by IBM — a handful of firms among the 594 currently authorized remarketers for the midrange.

For Summit Consulting, that fee means roughly a $10,000 charge on the company's $100,000 worth of operating system software, which had been provided and maintained by XL/Datacomp. IBM's most visible dispute with its industry remarketers surfaced in a lawsuit filed by XL/Datacomp, but the two companies reached a settlement in October.

Settlement reached

The terms of the XL/Datacomp settlement included a provision of IBM software support to XL/Datacomp's former customers at no charge or limited charges.

Yet those charges do not look so limited to Chuck Hudson, MIS manager at Lynchburg, Va.-based C. B. Fleet Co., Inc., another former XL/Datacomp customer. "It's not the money so much as the principle," said Hudson, whose company will have to pay $7,310 to get back into the IBM fold. "This causes a very bad feeling for my upper management, who are looking for a new manufacturing system now. IBM may lose what could have been a $100,000 sale for them over this."

"I can't see paying 12% for something I've already paid for," said Philip Zaczek, vice president of information systems at Allied American Insurance Co. in Park Ridge, Ill.

Industry analysts said IBM is reining in its remarketer channel to regain control over the steep volume discounting it allowed in 1988 and 1989.

"IBM wanted those boxes moved, and now IBM wants to see more control with the AS/400, since it's a very strategic machine," said Tony Membrino, an analyst at Technology Investment Strategies, Inc. in Framingham, Mass. Instead of discounting AS/400 hardware at 40% or more, IBM is now limiting its remarketers to 15% discounts, regardless of how many machines they purchase.

"IBM inadvertently let this whole situation occur, and then they took too long to fix it," said Dave Andrews, president of ADM, Inc. in Cheshire, Conn., an AS/400 consulting firm. "A lot of these small customers are finding they now have to pay back whatever they saved last year, when they bought their machines at a discount."

Market shift could drive EIS away from mainframes

BY CAROL HILDEBRAND
CW STAFF

Corporate America's shift away from a mainframe mentality could cause a number of applications to fall victim to Darwinian principles. Among these is the traditional executive information system (EIS), according to a recent report from Forrester Research, Inc. in Cambridge, Mass.

The report predicted that an EIS market shake-up would result in mainframe-based systems giving way to personal computer- and workstation-based EISs that are cheaper and easier to use and that can more easily access host, local-area network and PC-based data. Forrester pinpointed a number of trends that will lead the move away from present-day EIS toward what it called "open EIS."

According to Stuart Woodring, co-author of the report, information is growing outside the mainframe database in many sources. "For example, I don't think there are EIS systems that are going to go pluck information off a server database that happens to reside on a LAN in the marketing department," he said.

Woodring said open EIS will be able to use existing technologies, such as Microsoft Corp.'s Windows, LANs and SQL. This will make for added adaptability and cut down on the high costs of mainframe-based EISs. With their high degree of customization and heavy maintenance demands, EIS costs can exceed $500,000, the report said.

There is a catch

One drawback to the open EIS is that it will require a higher degree of computer literacy than mainframe-based aystems, which feature user-friendly interfaces and touch screens. But Woodring said that as traditional EIS vendors extend their products with drill-down and analysis capabilities, they also make them more complicated.

Open EISs are also not as powerful as their mainframe brethren. However, Woodring said, "I'm not sure that executives want to go that wild. How many real number-crunchers are there in the [executive] user population?"

Woodring cited products such as Forest & Trees from Channel Computing, Inc. as a good example of the open EIS trend, which he said was still in its early stages. "But within a couple of years, they'll have some really snappy products," he predicted.

EDI system accelerates customs processing tasks

ON SITE

BY SALLY CUSACK
CW STAFF

CHARLESTON, S.C. — If you are shipping grain to the Soviet Union, you better make sure you have cleared the transaction with the U.S. Customs Department.

That particular arm of the government oversees every item entering or leaving U.S. ports, and according to John D. Christensen, manager of information services at South Carolina's State Ports Authority, Customs is the Ports Authority's largest end user and operating partner.

"Our goal is to clear cargo as quickly as possible, and to do that, we must transfer information immediately to Washington D.C., and then act quickly on their response," he said.

The Ports Authority was one of the pioneers of the electronic data interchange (EDI) ideal. Eight years ago, the Ports Authority developed the Orion software system, a Cobol-based electronic filing system that runs in a CICS and VSAM environment on an IBM 4381 computer under DOS/VSE.

The Ports Authority claims that Orion gives the port an edge in rapid cargo movement by eliminating paperwork and subsequently moving cargo through the port five times faster than in most other ports around the world. "Cargo" in Charleston can be anything from grain to automobiles to heavy equipment.

Orion, which links 450 users throughout the waterfront community in Charleston, is in a constant state of evolution because of the variety of end users and their individual needs, Christensen said. The system is responsible for transmitting on-line information to and from brokers, shipping lines, freight forwarders, the U.S. Department of Agriculture and the customs agency in Washington, D.C.

"We are not standing back waiting for industry standards to be agreed upon," Christensen said. "We are implementing EDI functions now in conjunction with Orion, and with the exception of a single translator package, the effort was all in-house."

Orion consists of five primary components: Manifest, which provides data on bills of lading and related information through customs; cargo clearance; cargo movement; a customized built-in security function; and miscellaneous services such as electronic mail and query facilities for tracking status reports on cargo, ships and containers.

Referring to the waterfront community, Christensen said his department receives "100% participation from everyone in working together under the Orion system. There is an Orion committee which meets monthly to see what changes and enhancements need to be made to the system."

Update on the way

A mandate to upgrade the development strategy to include relational technology as an active participant in the Orion system is currently on the agenda, Christensen said. The Ports Authority is evaluating three database packages: IBM's DB2, Cincom Systems, Inc.'s Supra and Computer Associates International, Inc.'s Datacom.

The Ports Authority is also in the process of upgrading hardware and communications.

All of the Ports Authority's analog, bisynchronous communications lines have been converted to Synchronous Data Link Control, and there are now some personal computers in the field to replace several of the older IBM dumb terminals that link to Orion. Also, according to Christensen, the Ports Authority will make a decision on a significant hardware upgrade within the next 12 to 18 months. He added that he and his staff are now looking seriously at IBM's Enterprise System/9000 platform.

End users on the Orion system can track cargo through each stage of movement through the port. If cargo processing is delayed, for example, the system can determine where the cargo is and why it is being delayed.

While the Ports Authority is responsible for all enhancements, maintenance and repair of the software and hardware — a significant responsibility in itself — Christensen said the biggest challenge for IS is to "keep up with the rapid changes happening in the transportation industry."

SOFT NOTES

IPL teams up with Bull HN

IPL Systems, Inc. and **Bull HN Information Systems, Inc.** have struck a maintenance arrangement in which Bull will provide a range of support services for IPL's U.S. storage and tape subsystems.

Pulsar Systems, Inc. in Morris Plains, N.J., has received exclusive distribution and support rights to **Access Technology, Inc.**'s 20/20 spreadsheet for Prime Computer, Inc. systems. Under the agreement, Pulsar will perform all 20/20 program maintenance and provide enhancements and product releases for the Prime machines.

Control Data Corp. (CDC) in Minneapolis and **Volkswagen AG** in Wolfsburg, Germany, have created a joint venture to develop computer-aided design, manufacturing and engineering (CAD/CAM/CAE) software for the worldwide manufacturing market. The business, called Icem Systems GmbH, will focus on future development of Icem, a family of CAD/CAM/CAE products developed by CDC.

COMMENTARY

James Daly

One lawsuit too many

What a difference a day makes.

Ashton-Tate struggled back from two years of red ink, rid itself of a chief executive officer who admittedly didn't know how to use its flagship product and finally reversed its slipping market share. But it took only one federal judge and a simple ruling delivered on a sunny Southern California morning to make the company once again look like the kid who just can't do anything right.

The move came as the denouncement of a Dbase copyright protection suit Ashton-Tate filed against Fox Software two years ago. In effect, Ashton-Tate saw its own firecracker blow up in its hands: U.S. District Judge Terrence Hatter Jr.'s edict stripped the crucial Dbase product line of its copyright protection because the Torrance, Calif.-based company "knowingly" misled the U.S. Copyright Office by "repeatedly" failing to acknowledge that Dbase was derived from a program in the public domain.

While there is still plenty of legal jockeying to go before we see if the verdict actually sticks, many have already popped the cork on the cham-

Continued on page 44

More Macintosh developers writing for Windows arena

BY JAMES DALY
CW STAFF

Software developers who once primarily focused on putting their best foot forward building crackerjack applications for the Apple Computer, Inc. Macintosh platform are increasingly doing the unthinkable: developing for the DOS world.

Now that Microsoft Corp.'s Windows 3.0 gives IBM Personal Computers and clones the simplified windows-and-icons appearance of the Macintosh, recession-wary developers are hungrily eyeing a DOS market that, at upwards of 40 million users, is nearly 10 times larger than Apple's steadily shrinking slice of the PC industry's pie, according to Framingham, Mass.-based market research firm International Data Corp.

"I can't think of any Mac developer who isn't writing for Windows," said Kathleen Lane, president of Softview, Inc. The Oxnard, Calif.-based company recently unveiled the fruits of a 12-member research and development team effort when it released a Windows 3.0 edition of its Macintax tax preparation package.

Lane added that the rapid success of Windows 3.0 — Microsoft officials claim to have sold more than one million units since it was introduced in May — should lure developers with similar vertical market applications, such as accounting packages, that are big in the DOS community.

Many developers said the graphical environment of Windows 3.0 cleared away many of the hurdles that came with character-based DOS applications. "Before, we needed to make a lot of compromises to address the DOS world, but that's no longer true," said Stephen MacDonald, senior vice president at Adobe Systems, Inc. "We see the PC world as the real opportunity area for us in the future. Our No. 1 job now is to migrate our Mac applications over to Windows."

MacDonald said Adobe is migrating many of its typefaces over to DOS in what will result in a dramatic sales realignment of the Mountain View, Calif., firm. Although less than 25% of Adobe's business now comes from the DOS world, that figure will rise to more than 50% during the next year, MacDonald said.

Apple users said they will keep a close eye on the amount of new software releases at January's Macworld Expo in San Francisco to see if the Windows development signals a refocusing of developer efforts.

"If there is a significant capital migration of programmers and dollars over to Windows, and developers are dropping everything to create packages for Windows, then it's really going to hurt," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Corp. in Sunnyvale, Calif.

The secession has clearly worried Apple's top management. Analysts have long speculated that Apple abandoned longstanding plans to spin off its Claris Corp. software unit into a separate business in early 1990 because it feared Claris would focus on building applications for Windows 3.0.

Apple Chief Executive Officer John Sculley said he is hoping the success of a trio of low-cost Macintosh releases in October 1990 will dissuade any more defection. "We need the new products to restore developer momentum," Sculley said at a recent conference. "[Windows] could certainly affect our ability to attract independent software developers."

Softview Senior Vice President Ron Frankel acknowledged that the rapid sales of machines such as the low-end Macintosh Classic "has certainly renewed our enthusiasm for the Mac line." But, he added, "you still have to look at the whole picture. The growth in the Macintosh market just hasn't been there in the past few years, and that's got to change for us to prosper."

Dual-processor LAN Manager available

BY JIM NASH
CW STAFF

Four months late, Microsoft Corp. announced the availability of dual-processor add-on software for its LAN Manager network operating system in mid-December.

Microsoft said the first version will run on a Compaq Computer Corp. Systempro server.

Originally scheduled for shipment in August, LAN Manager Multiprocessor Server Pak is expected to free up CPU functions by automatically passing off networking tasks, such as file serving, to a secondary Intel Corp. 80386 or I486 chip in the Systempro.

Dennis McEvoy, president of Cooperative Solutions, Inc., a San Jose, Calif., software developer, said he received a beta-test copy of the package this month. The primary chip, he explained, will hold application code, including Sybase, Inc.'s SQL Server, while sharing the same memory between it and the secondary chip.

Internal testing of the Systempro in a client/server architecture running LAN Manager and SQL Server boosted performance about 40% using dual processing, said David Thatcher, LAN Manager product manager.

McEvoy, who already uses a dual-processing version of LAN Manager on a Parallan Computer, Inc. Server 290 midrange system, said he did not expect the same doubling of performance seen with some Unix systems using multiple processors.

The LAN Manager Multiprocessor Server Pak is priced at $2,495 and is available through Microsoft resellers.

Micro Focus Dialog System

The Human Interface Management System

MICRO FOCUS®
A Better Way of Programming™

Micro Focus Dialog System™ is a high level tool that produces and runs user interfaces for COBOL applications. Whether your application runs under OS/2 or DOS, you can develop sophisticated interfaces for a variety of styles and emerging standards, without changing your COBOL programs. Dialog System is as versatile as your needs and imagination.

Dialog System is also the best development system available for graphical and character based user interfaces to front-end your mission critical business applications.

- A simple CALL interface is the link between your COBOL programs and Dialog System. Writing long, complicated user interface code in COBOL will become a thing of the past.
- Smaller, maintainable code will result from using Dialog System. The user interface is defined and run independently of the main COBOL program.
- Prototyping is simplified because you don't have to begin writing the data processing part of your application until after the interface is tried and tested.
- Testing support is provided in Micro Focus ANIMATOR™ as well as the Dialog System utilities Trap and Trace.
- Preserve your COBOL investment by using Dialog System to create the user interfaces you need and users want without learning new languages.

Bring the look and feel of the 90's to your applications with Micro Focus Dialog System.

The Early User Program version of Dialog System 2 gives easy access to Presentation Manager or SAA CUA objects.

For more information about Dialog System 1.1 or Early User Dialog System 2, call Micro Focus today at 1-800-872-6265 or 415-856-4161.

Appletalk extended to PCs

BY JAMES DALY
CW STAFF

EMERYVILLE, Calif. — Farallon Computing, Inc. has become an early winner in Apple Computer, Inc.'s continuing push to disseminate key portions of its technological research. Farallon has announced that it will begin developing and marketing Appletalk networking products for Microsoft Corp.'s MS-DOS and Windows 3.0 platforms.

Insiders at Farallon, a 4-year-old networking firm, said the firm plans to take the licensed Apple networking technology and make it available for mixed environments of IBM Personal Computers and Apple Macintoshes.

Farallon's first offering is expected to be shown at the Macworld Expo in San Francisco in January.

The push is on

Apple researchers have long sought multiplatform options for Appletalk, the Cupertino, Calif.-based firm's method of allowing Macintosh computers transparent access to network-linked printers and other resources. Farallon's offerings will give Macintosh users a wider range of connectivity options and make it easier for Apple to push the Macintosh into large corporations that currently have many IBM PCs and clones.

Farallon is considered one of the major suppliers of Apple networking products. The privately held firm produces the Phonenet networking system, which allows the creation of networks containing tens of thousands of nodes. There are approximately 1.5 million computers connected on Farallon networks, according to company estimates.

While all of Farallon's technology has been built around the Macintosh, Farallon sources said that they hope to move quickly into the IBM-compatible world with inexpensive solutions to complex networking problems.

Only XDB is 100% DB2 compatible and gives you mainframe power on your PC.

That's right, XDB lets you offload DB2 development onto a PC. Consider the productivity gains and mainframe resource savings!

With XDB, any DB2 programmer can develop, test, and run applications on a PC and then run the finished code — without modification — on the mainframe.

If you want, you can even run DB2 applications on a LAN with the powerful XDB-Server. Imagine the benefits of downsizing mainframe applications!

DB2 On Your PC.

XDB's SQL engine supports all mainframe DB2 SQL syntax, imports and exports DB2 data and schema, and works with both ASCII and EBCDIC. Its mainframe power includes dynamic SQL, domain and referential integrity, updatable views, transaction management, backup/recovery, security, data dictionary, and automatic record and table locking. And yes, it will do all of this on your PC under DOS, OS/2, or Windows 3.0.

In fact, the XDB SQL engine is so compact that it runs on any PC in under 300K, leaving plenty of room for your application.

And you can access mainframe DB2 data with the XDB-Link gateway.

COBOL And C With SQL.

XDB lets you write programs with embedded SQL in COBOL or C. The XDB-Workbench integrates seamlessly with the Micro Focus COBOL/2 Workbench enabling you to take full advantage of a rich programming environment.

Rapid Application Development.

XDB provides tools to further increase your productivity.

Our visual Report Writer makes report development intuitive and our Forms Generator lets you paint sophisticated data entry and transaction screens.

Top Rated SQL Product.

In review after review, XDB products consistently receive the highest ratings. *PC Magazine* named XDB an "Editor's Choice." *Software Digest* ranked XDB first among advanced SQL products. And *PC Week* ranked XDB tools first among Client/Server database systems.

When you scrutinize our products the way experts do, we think you'll agree: XDB offers productivity benefits no one else can match.

Get the details. Call today at **(301) 317-6900**

XDB Systems, Inc.
14700 Sweitzer Ln.
[illegible], MD 20707-2921

xdb

We Put DB2 On Your PC.

Fax (301) 779-3429. For instant information, call our Fax BBS (301) 779-4660 ext. 1236 from your Fax machine.

"The only tool available that adheres closely enough to IBM's DB2 to allow applications developed on the PC to be migrated to the mainframe with little or no modification." PC WEEK

"Speedy performance, a rich SQL implementation, and general ease of use make this package a winner." PC

"XDB offers strong capabilities for advanced database management with PC ease of use." PC WEEK

"Develop on PCs then run the finished software without changes against DB2 data on mainframes thanks to XDB's DB2-compatible database server software." DBASE IV

Daly

CONTINUED FROM PAGE 43

pagne. To software developers, the suit and its inherent implication that programming languages could be copyrighted lingered like a bad smell. To users, Ashton-Tate had grown fat and sloppy, offering an erratic product update schedule.

By eliminating Ashton-Tate's sole rights to Dbase, the door is now open for the development of Dbase clones. The likeliest candidates for entry are Borland International — which reportedly tried to buy Ashton-Tate several months ago — and Microsoft, which is expected to release its first database software product in the near future.

Dbase customers said they look forward to the effect the judgment will have on their checkbooks. "Prices will go down, and quality will go up; that's what competition is all about," said Scott Fueless, a principal analyst at M. W. Kellog Co., an engineering and construction firm in Houston.

In the end, Ashton-Tate got beaten at its own game, competing in the courtroom instead of the marketplace. For years, the company has failed to improve its products and has used the courts — rather than the research and development labs — to protect its products.

WHILE HATTER'S ruling was a victory for users, his decision to throw the case out on a technicality unfortunately left the central question of the case undecided: Can a programming language be copyrighted?

Users have grown weary of these internecine legal battles between software developers. "Personally, I'm sick of these look-and-feel lawsuits," said Jeff Smiley, a computer specialist at Resources Conservation Co. in Bellevue, Wash. "Just like with PC clones, software vendors keep building the same thing but improve on it as they see fit. And the similarity between the different packages is something we can count on to ease training and help us better integrate them into our system," he said.

The suit was filed to stymie Fox, which has severely threatened Ashton-Tate's former dominance of the PC database market. Dbase-workalike products now account for 20% of the PC database market, according to researchers at investment firm Alex. Brown & Sons.

While Hatter's ruling was a victory for users, his decision to throw the case out on a technicality unfortunately left the central question of the case undecided: Can a programming language be copyrighted? Expect to see that issue pop up again during the next few years.

But right now, it's time for Ashton-Tate to lick its wounds and map out a future based on innovation and not litigation. Without a deep technical base and no legal barrier against competitors, it's going to be a tough few years for the scrappy firm.

Daly is a *Computerworld* West Coast senior correspondent.

IBM lowers Netview prices

BY ELISABETH HORWITT
CW STAFF

IBM announced a massive reduction in high-end centralized system pricing for Netview Version 2 in December, claiming that the original price structure — which encouraged users to migrate from multiple centralized systems to a distributed network management strategy — was simply ahead of its time.

"Customers we talked to told us we had overestimated their readiness to move to a distributed, unattended system," said William Warner, IBM Communications Systems director of network management. "Under the old Version 2 pricing, users would pay a huge price for multiple central systems — in some cases over 100%" more than they paid for the older Version 1.1, Warner added.

IBM has lowered the cost of purchasing distributed Netview Version 2 for all host groups higher than Model Group 30, and of the centralized Version 2 for all model groups above Model Group 29, according to Ken Siedler, IBM's director of networking product marketing. The higher the group number, the greater the price decrease.

For example, the basic monthly license charge for central Netview Version 2 for MVS/XA, Model Group 50, was $3,453 under the old pricing structure and will be $1,822 according to the new one. Pricing for a comparable Netview Version 1.1 purchase is $1,300.

Model groups below the respective "pivot points" outlined above will be priced slightly higher under the new structure, an IBM spokesman said. However, IBM is giving a break to those users who have already made migration plans based on the old prices: those that install Version 2 by June 30, 1991, will pay the lower Sept. 5, 1990, prices for the software through the end of 1991, Siedler said.

Pricing maze

The Travelers Corp. is more interested in comparing the new Netview Version 2 pricing with Version 1.1 pricing than in comparing old and new Version 2 pricing, according to Jim Oleksiw, telecommunications director at Travelers.

The insurance firm had tentatively decided to wait for Netview Version 2.2, expected out in spring 1991, because Version 2.1 did not offer enough added functionality over Version 1.1 to justify migration under the old pricing structure, according to Oleksiw.

The price changes "sound like IBM is responding to its customers," Oleksiw said. "I don't think anyone was pleased" by the original Version 2 pricing, particularly high-end users such as Travelers, which primarily uses IBM mainframe Model Groups 40, 50 and 60, he added.

IBM is still expecting users to move from multiple central Netview hosts to one centralized host and several distributed systems, with automation applications gradually replacing the need for trained technicians at remote sites, Warner said. Current barriers in the way of such migration, he added, include the cost of developing automated applications, the cost of retraining and "political factors" such as network managers at remote sites resisting the loss of their autonomy.

IBM is lowering prices for distributed as well as centralized high-end systems, because it does not want to further discourage users from moving to distributed network management, "which everyone, including us, agrees is the wave of the future," said Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc.

IBM is also lowering the price of the Graphic Monitor Facility Workstation from $8,000 to $3,000, in recognition that users who are not yet ready to automate network management functions will continue to need multiple management workstations, Warner said.

IS: The hottest thing to hit Hollywood since the phone

ON SITE

BY JIM NASH
CW STAFF

"Cookie! You bring me Tom Hanks and Morgan Fairchild for *Romeo & Juliet, Part II*. I've got goose bumps. Do I love this man? Listen, let's do some E-mail."

The industry that raised schmoozing to an art form is going electronic. William Morris Agency, Inc., a large talent agency in Beverly Hills, Calif., installed 200 Next, Inc. workstations a year ago alongside 100 personal computers in a coast-to-coast wide-area network.

Agents in New York, Nashville and Beverly Hills can access the network and electronically thumb through a database containing a literal *Who's Who* in entertainment. The pairing of entertainment and computer industries is a natural, said Alex Henry, information systems manager at William Morris. Both are based on the power of information.

A talent agent's challenge is to remember who is available for which project at what price. Henry said William Morris' philosophy is that every agent represents every client.

Without near-immediate access to shared information, that premise could be lost in a worldwide corporation. Common access and the ability to send or receive requests through electronic mail have snagged new admirers, including former "technophobes," he said.

"We have agents who have never touched a computer, and they say, 'My assistant can have one,' " Henry explained. "We come back two or three weeks later, and they say, 'Give me one, too.' "

In demonstrating the network, Henry paged past some surprising personalities: Hanks, former U.S. Surgeon General C. Everett Koop, game show host Bob Barker, author Tom Clancy and comedian Andrew "Dice" Clay. Every night, information on them and others in publishing, movies, video, music and stage are updated on servers.

Talent agents *use Next workstations to match clients with opportunities*

"I have heard agents say they are 30% more productive. I can tell you how loud they scream when the machines are down," Henry said.

Henry could be an IS executive in almost any company. The former consultant at Deloitte & Touche exhibits none of the smarm and flash of most show business intimates, aside from a minor tendency to drop major names.

He oversees a system that grew out of a small AST Research, Inc. network running Novell, Inc. software over Arcnet in the Nashville office's music department. In classic Hollywood fashion, the idea came two years ago from an unknown, a temporary employee named Mia Bain, who had seen networks used in other offices. Today, Henry said, she is system manager of that network.

The Nashville office, which concentrates on the music industry, continues to rely on PCs, as do the music departments in both New York and Beverly Hills. Employees in Beverly Hills operate 164 Next workstations tied via Ethernet to 12 Next file servers. New York has 17 workstations and two file servers, and another 75 workstations have been ordered, Henry said.

He said one of the Novell servers in the Beverly Hills music department has been moved onto Ethernet — the first step in allowing users on both sides of the protocol wall to share files. He anticipates setting up either gateways or E-mail to bridge the gap before eventually standardizing on Next networks.

A 9.6K bit/sec. leased line connects New York and Beverly Hills, Henry explained. However, he added, that connection should be upgraded to a fractional T1 line this year.

In a satisfying twist, the speedy lines and Next's brawn are making possible memos that for all the world look like black-and-white commercials featuring the performers agents are promoting.

One such 15-frame-per-second memo, which was based on software developed by Adamation, located in Oakland, Calif., stumped for Clay's summer movie, *Ford Fairlane*.

"The William Morris system unquestionably is state of the art," said Lee Gruenfeld, a partner at Deloitte & Touche's information technology unit.

Gruenfeld and Henry worked on the project, recommending and installing the Next network.

Teleos links LANs over ISDN

BY JOANIE M. WEXLER
CW STAFF

EATONTOWN, N.J. — Integrated Services Digital Network (ISDN) vendor Teleos Communications, Inc. is facing off with T1 suppliers to provide equipment that companies can use to build hybrid public/private networks and reduce the number of communications lines they need.

A joint venture with IBM has resulted in an enhancement to Teleos' IAP6000 ISDN Access Server that allows it to link token-ring local-area networks over primary-rate ISDNs. This is reportedly the first product to support IBM's proprietary source-route bridging over ISDN, IBM spokesman Dennis Drogseth said.

The IAP6000 is a device that multiplexes a mixture of voice, data, image and video services onto one 1.54M bit/sec. primary-rate line. Traffic on the primary-rate line, which includes 23 64K bit/sec. channels, can then switch traffic to 23 remote locations simultaneously, explained product manager Tim Rubert. "Without the primary-rate access, users would need a lot more bridges and lines," Rubert said. While he acknowledged that the cost of multiple stand-alone source-routing bridges might trade off with that of an IAP6000, users gain the benefits of a 24th ISDN channel — the signaling channel — that can provide calling- and called-party number identification, as well as several other ISDN extras.

Dial-up bandwidth

"I want dynamic bandwidth allocation for everything," said George Paulous, telecommunications manager at Blockbuster Entertainment Corp. in Dallas. Bandwidth on demand is an advantage of ISDN in that users do not have to nail up and pay for circuits that may sit idle during nonpeak periods of the day.

Paulous said he is considering the IAP6000 to access ISDN for imminent videoconferencing applications between Blockbuster's two main offices in Dallas and Fort Lauderdale, Fla. He added that he would also like to use it to replace the dial-up modems and lines he uses daily to poll terminals in the 1,500 Blockbuster stores worldwide.

Ungermann-Bass makes a move into open systems

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. is cautiously stepping away from the proprietary enclave it has carved out for itself.

The company, which for a decade has focused on building virtually custom networking systems for large corporations, recently announced a network management tool that promises to be less proprietary.

The product is called Netdirector and is due in its first incarnation next month. A spokesman for the firm, a subsidiary of Tandem Computers, Inc., said Netdirector will monitor and control Ungermann-Bass networking components using the Xerox Network Systems Courier protocol. It will combine Sybase, Inc.'s SQL Server Version 1.1 and Microsoft Corp.'s LAN Manager Version 2.0 with the OS/2-based management software.

Ungermann-Bass said it will eventually support Simple Network Management Protocol and Common Management Information Services/Common Management Information Protocol.

It is working with British Telecom PLC to give limited two-way communications between Netdirector and British Telecom's Concert, a manager of devices such as Netdirector. Ungermann-Bass has demonstrated a similar collaboration with IBM's Netview software, but no product has been announced.

Several user shops that have seen beta-test versions said they were impressed by Netdirector. David Contreras, senior network engineer at Harris Methodist Health Services in New Orleans, has given it a two-month test.

Contreras said Harris has been looking for better ways to manage its 240-workstation network. "This is a direction we've been moving in for some time. Now we can use a single workstation and see a lot of events simultaneously," he said.

However, he said, he would like to see more consistency in keyboard and mouse requirements among Netdirector's various windows.

Doyle Friskney, director of communications and networking at the University of Kentucky in Lexington, said he liked the inclusion of an SQL database.

> "NOW WE CAN use a single workstation and see a lot of events simultaneously."
>
> DAVID CONTRERAS
> HARRIS METHODIST
> HEALTH SERVICES

He said the system is likely to pay for itself in data entry and data retrieval time savings. Using the database, Friskney said, he will combine four other databases that track the equipment and personnel associated with each part of the 45 local-area networks he manages. Administrators will have histories of machines and their users at their fingertips, he said.

Todd Dagres, an analyst at The Yankee Group in Boston, said information systems managers with large installed bases of connectivity equipment from market leaders Vitalink Communications Corp. and Cisco Systems, Inc. are likely to ignore Netdirector. This will limit the package's appeal to the 100 or so large corporations that have standardized on Ungermann-Bass bridges, routers, intelligent wiring hubs and other connectivity devices.

Netdirector costs between $7,500 and $16,000 and will reportedly contain Xerox Network Systems and Transmission Control Protocol/Internet Protocol drivers. Future versions are expected to include Microsoft's Presentation Manager for topological maps.

For Security Across Multiple Hardware Platforms, There's Only One Safe Choice.

Trojan Horses. Logic Bombs. Worms. Hackers. Viruses. Disgruntled employees.

Information systems today are under siege.

Every enterprise, every environment, every system is vulnerable.

Unless it's protected by CA-UNIPACK®/SCA.

Only CA-UNIPACK/SCA provides comprehensive, integrated security across all of your most important hardware platforms and operating systems.

CA-UNIPACK/SCA is a proven, practical solution that includes the most advanced security, control and audit software in the world.

It offers you a secure, protected environment across multiple hardware platforms, operating systems and wherever your distributed processing takes you including MVS, VSE, VM, VMS, networks, DB2 and PC/DOS.

CA-UNIPACK/SCA provides access control, VTAM network control, network session management capabilities and an automated approach to reviewing operating environments. It also offers you enhanced administrative flexibility, unsurpassed ease of use, single point access, and extensive auditing & reporting.

But most importantly, CA-UNIPACK/SCA gives you total control of access to one of your most important corporate assets: information.

CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution

And now, with our Computing Architecture For The 90s, CA-UNIPACK/SCA can deliver even higher levels of integration and provide total data center automation by working seamlessly with other CA-UNIPACKS that automate Production, Storage, Performance Management, and Data Center Administration.

To learn more about CA-UNIPACK/SCA call 1-800-645-3003 and find out where your organization may be vulnerable.

Before someone else does.

COMPUTER ASSOCIATES

1990 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787
All trade names referenced are the trademarks or registered trademarks of the respective manufacturer.

MANAGER'S JOURNAL

EXECUTIVE TRACK

Henry Veldman, former director of technology at Allied-Signal Corp., has been named associate director at the **Automotive Industry Action Group (AIAG)** in Southfield, Mich. The AIAG, with 1,000 members from more than 700 companies, is a volunteer association working to increase the productivity of the motor vehicle and vehicle parts industries.

Veldman previously directed Allied-Signal's computer-aided design and manufacturing (CAD/CAM) technology group and was responsible for CAD/CAM systems throughout the $12 billion firm's worldwide operations.

At the AIAG, Veldman will coordinate the activities of both the CAD/CAM and continuous quality improvement project teams.

.....

George R. Balascak has been promoted to the new position of managing director of technical services at **Sea-Land Service, Inc.** in Edison, N.J.

Balascak was most recently director of technical services at Sea-Land. His new duties include managing the development and implementation of several major communications initiatives and managing technical support associated with new business ventures. He reports to John O. Parker, senior vice president of information resources.

Balascak joined Sea-Land, now a unit of CSX Corp., in 1965 and has held a series of positions in communications and information resources.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Executive Track. When you have news about any staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Turning the tide with technology

EDI could transform the TV ad business, but it won't be smooth sailing

BY JIM NASH
CW STAFF

Television's fiercest battle of this decade may not be Bud Bowl III or even a grudge wrestling match between Hulk Hogan and Rowdy Roddy Piper. It is more likely to be a slugfest between those who are trying to promote automated communications tools such as electronic data interchange (EDI) and those who oppose them.

EDI proponents claim that nothing less than the very survival of a business is at stake. Advertisers that spend an estimated $25 billion annually on the oldest video medium, network and local TV, now have rapidly multiplying options.

New avenues, such as in-store commercials, cable TV and home videos, are pulling advertisers away from traditional broadcasting, says Joe Harris, director of information technology at the TV Stations Division of NBC. However, Harris says he believes there is one way for television to hold onto its sponsors: by making the process of placing ads easier and more efficient.

Few disagree with Harris' premise. But if efficiency means implementing EDI, stand back while everyone takes sides. The industry's dilemma typifies what could be the largest barrier to transforming business with information technology: resistance to change.

Opponents of EDI in the ad sales process, most of whom are intermediaries, fear it could result in electronic bulletin boards that simply list which stations have spots to sell, when the spots run and how much they cost. In short, opponents say, ad sales could become a commodity market with no use for the companies that today act as agents for TV stations.

Commonly referred to as "rep firms," these companies do much of the voluminous paperwork involved in ad contracts. But they go further by convincing advertisers that national or local spots are worth more than the ratings for a station's programs would indicate.

"There are those that would like to link up the entire business, and that is not what's in the best interest of our clients," says a rep firm information systems manager who requested anonymity. Stations spend millions positioning themselves, citing intangibles such as a station's civic involvement or its news show anchor. None of this would be translated through a bulletin board, the manager says.

Harris, who helped found Queens (N.Y.) College's first student radio station as an undergraduate there before moving on to professional television, says that bulletin-board services would not put rep firms out of business by themselves. He points out that there is already at least one on-line service for print and cable ads and a more limited computer system for TV.

Randall Spangler

The IS waters *are anything but calm in the television industry, where EDI proponents such as NBC's Harris are meeting resistance to change*

In the case of broadcasting, Harris says, EDI could stop at merely transmitting documents, change orders and confirmations. Placing an ad today is a cumbersome process that involves the advertiser, its ad agency, the rep firm and its TV station client.

Information is passed on paper and by voice back and forth repeatedly between the time a company decides to advertise and the time the station is paid for the commercial.

Expensive mistakes

Besides being lengthy, the current system costs the TV industry $2 billion per year in errors, Harris says. That is what he estimates is never collected by stations because of communications errors.

But rep firms worry that EDI presents a slippery-slope situation: One step down could mean a slide to the bottom.

Tribune Broadcasting Co. in Chicago is one player that remains cautious about EDI's ramifications. "We're both a buyer and a seller of commercials," says Bill Murray, director of IS at Tribune Broadcasting. "That gives us relationships on many sides of the fence," including one as a rep firm.

Tribune Broadcasting is part of Tribune Co., a media conglomerate whose portfolio includes the *Chicago Tribune*, superstation WGN-TV and the Chicago Cubs baseball team. It also includes TBC Plus, a TV rep firm. Although TBC Plus contributes no more than 5% of Tribune Co.'s revenue, it is "a test bed" that could pave the way for larger ambitions there, Murray says. He adds that the parent company is not prepared to endanger TBC Plus by pushing EDI.

But from WGN's perspective as well, the company opposes EDI. "Our motivation is pretty selfish, really," Murray says. EDI has the potential to turn broadcast advertising into a commodity in which the only good sold is the value of each station's market share. "If I reach 15% of the [TV viewing] market, I could demand only 15% of the ad revenue," he says.

Harris admits that Murray "speaks for the majority of the industry." That majority, he contends, is losing sight of one thing. "The laws of supply and demand here are changing; there is more supply," he says, referring to the increasing number of ad options open to advertisers.

Harris, a gregarious former ad salesman at NBC, insists that the situation requires an end to the status quo. To stanch the erosion of advertising, he proposes an alliance of broadcasters and rep firms to begin automating the ad process. A nonproprietary EDI system would simplify sales and allow rep firms to concentrate on representing rather than documenting, he says.

Harris worries that nontraditional broadcast media, which have already changed the business through various innovations, may also be the first to embrace EDI.

"If we don't do it, a competing media will — and will pave over broadcasting," he says. "Then we in the traditional television industry will be behind the eight ball."

Wendy's still has the beef but loses its veteran IS chief

BY CLINTON WILDER
CW STAFF

DUBLIN, Ohio — Hari Notowidigdo's tenure as Wendy's International, Inc.'s top information systems executive goes back even further than the "Where's the beef?" commercials, but now he is moving on.

Notowidigdo, vice president of IS for the past seven years, will leave the company in early January to pursue some new business interests. He said he has no dissatisfaction with the billion-dollar fast-food chain but is leaving for personal career reasons.

Looking for something new

"I always wanted to do something else beyond just retiring as CIO," he said. Notowidigdo declined to discuss his specific plans until they are more definite. Wendy's has not yet named a replacement.

Notowidigdo joined Wendy's as vice president of IS in 1983. He had previously worked at Borden, Inc., where he had been corporate director of information resource management.

Of his accomplishments at Wendy's, Notowidigdo said he is most proud of achieving effective IS management with a small IS staff, which currently numbers just 82. "I'm the lowest cost producer in the industry," he said.

Other notable IS implementations at Wendy's include joint development with IBM of a wireless terminal system and use of a personal computer-based expert system that helps Wendy's service representatives repair cooking and high-tech equipment at restaurant sites [CW, Sept. 25, 1989].

3290...THE NEXT GENERATION

The Visible Advantage™ workstation plugs right into your 3290 applications

At last, an intelligent migration path to the next generation 3290.

Based on personal computer technology, *The Visible Advantage* software manages up to eight host sessions at a time...displays up to four full host sessions concurrently ...in high resolution monochrome or color.

Use *The Visible Advantage's* color highlighting, dynamic font sizing, APIs, and DOS session support to improve operator efficiency in time sensitive customer service and transaction processing.

Use *The Visible Advantage* in standalone or LAN configurations with any SNA host interconnect options.

The Visible Advantage requires:
- no IBM® host program changes
- no controller reconfiguration
- no new cabling • no retraining.

See for yourself! Call 800-722-2482.

Rabbit SOFTWARE

A Safeguard Scientifics Partnership Company

The Visible Advantage software runs on IBM® AT and PS/2® computers, and compatible PCs

Rabbit Software Corp. • 7 Great Valley Parkway East • Malvern, PA 19355 • Tel. 800-722-2482 or 215-647-0440 • Fax 215-640-1379

CALENDAR

JAN. 13 - 19

ICA Winter Seminar. Houston, Jan. 13-16 — Contact: International Communications Association, Dallas, Texas (214) 233-3889.

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Computer Graphics Show. New York, Jan. 15-17 — Contact: Computer Graphics Show, Silver Spring, Md. (301) 587-4545.

Service and Quality: Tactical Deployment. St. Louis, Jan. 17-18 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

Strategic Technology Implementation. Wellesley, Mass., Jan. 17-16 — Contact: CIMS Office, Babson College, Wellesley, Mass. (617) 239-4531.

Landex '91. Irvine, Calif., Jan. 17-19 — Contact: Landa, Elmhurst, Ill. (708) 863-3111.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speranza, Wordtech Systems, Orinda, Calif. (415) 254-0900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan. 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8646.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Linke, PEMCO, Des Plaines, Ill. (708) 299-3131.

JAN. 27 - FEB. 2

Conference on Image Management Systems. Phoenix, Jan. 27-30 — Contact: BIS CAP International, Norwell, Mass. (617) 893-9130.

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Outsourcing: Options and Tactics. Orlando, Fla., Jan. 29-30 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

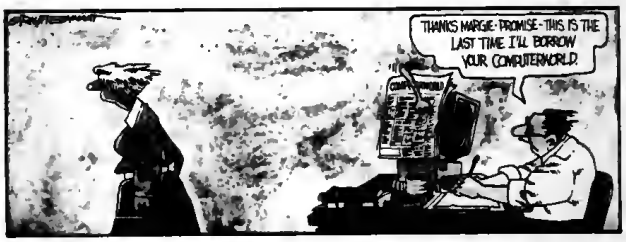
Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Coy, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

Seventh Annual Nolan Norton Institute Conference: The Enterprise of the Future —Today. Tarpon Springs, Fla., Feb. 7-8 — Contact: Nolan Norton Institute, Lexington, Mass. (617) 862-8820.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $58.97. Central/South America $130, Europe $195/all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgr. Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs. Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
85. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
99. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Supermms
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4101B-6

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $58.97, Central/South America $130, Europe $195. all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgr. Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs. Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
85. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
99. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Supermms
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4101B-6

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NATIONAL
BRIEFS

State of grace

Two major institutional lenders were willing to extend a grace period to technically defaulting Tinton Falls, N.J.-based **Concurrent Computer, Inc.** this past autumn on the basis of an early look at a recapitalization plan being devised under the aegis of investment banker **Goldman, Sachs & Co.** The National Association of Securities Dealers Automated Quotations System (NASDAQ) followed suit. Although the firm has failed to meet NASDAQ's capital and surplus requirement, exchange officials continue to trade in Concurrent stock.

Good buy again

Vienna, Va.-based software house **Legent Corp.** furthered two of its often stated goals — growth by acquisition and extension of its software and service offerings beyond the IBM platform — with the recent purchase of Renton, Wash.-based **Flexlink International Corp.** Terms of the purchase were not disclosed; however, Legent Chief Executive Officer John Burton knows a good buy when he sees one: Burton came to Legent as part of the company's 1989 acquisition of **BST, Inc.**

Boomers

Gateway 2000's 151,681% growth over its first five years in existence was enough to land the North Sioux City, S.D.-based personal computer vendor in the No. 2 spot on *Inc. 500, Inc.* magazine's annual list of the 500 fastest-growing U.S. entrepreneurial companies. The computer industry contributed no less than 60% of *Inc.*'s Top 10 for 1990: **Corporate Express**, No. 4; **Computerware**, No. 5; **Brooktree**, No. 7; **Octocom Systems, Inc.**, No. 9; and **Northgate Computer Systems**, No. 10.

Happy holidays

Cary, N.C.-based **Compusource** came up with a Christmas present for **Hotsite**, its disaster recovery services division: the assets of **El Camino Recovery Services**, a joint venture company of third-party leasing firm **El Camino Resources Ltd.** Hotsite provides disaster recovery services to the IBM mainframe market. According to Compusource CEO Wayne Edge, the El Camino purchase is but the first of a series of imminent acquisitions.

It's not a bird, not a plane, but what exactly is 3Com?

ANALYSIS

BY JIM NASH
CW STAFF

3Com Corp. is a networking software company. No, it is a wide-area networking hardware firm. Hold everything: 3Com is a dessert topping.

The Santa Clara, Calif.-based firm that detractors condemn as trying to be all things to all people is doing it again. Although 3Com has refused to comment on the matter, internal documents state that the firm plans to abandon the local-area network operating system market.

Eric Benhamou, *3Com's chief executive officer*

It will instead concentrate on ambiguously described hardware and software for routers, bridges, servers and network management. According to documentation obtained by *Computerworld*, 3Com will sell the rights to its LAN Manager-based 3+Open software and license research and development for LAN tools to Microsoft Corp.

The documentation states that all current work on key development projects such as 3Com's X.500 electronic mail directory, Apple Computer, Inc. Macintosh connectivity and LAN Manager-Netware links will be basically handed over to Microsoft. Through the deal, 3Com essentially becomes a generic OEM.

While strategy shifts are to be expected from any firm, the number and nature of the changes at 3Com are beginning to disconcert some of the firm's users.

End-to-end connectivity was 3Com's "last value-added" product, said Matt Scholz, information systems manager at the San Diego County Water Authority. "They've changed their name to '3C-OEM.'"

Like Scholz, Bob Saur, IS manager at Index Technology Corp. in Cambridge, Mass., bought into 3Com's history of linking personal computers to PCs with a minimum of third-party products.

Now, Saur said, "somebody else makes their E-mail systems, and somebody else makes their network operating system."

"They should go back to being an adapter company if they can even do that," Scholz said. It was, in fact, a multibus Ethernet card for a Digital Equipment Corp. VAX that got 3Com off the ground in 1979, said Bob Buchanan, former 3Com program manager for distributed systems.

And it was the PC/Ethernet card business that helped fuel the company's numerous forays into related networking technologies. That dull but reliable profit workhorse continues to buoy 3Com.

In 1982, Buchanan said, 3Com began providing a network operating system that ran on Ethernet as well as servers and workstations. Three years ago, 3Com merged with Bridge Communications, Inc. to expand into communications hardware, explained Buchanan, now vice president and general manager of testing at Lanquest Group, Inc. in San Jose, Calif. In 1988, 3Com moved toward greater standardization with 3+Open, a value-added bonnet on LAN Manager.

Doug Whitman, president of Vencom, Inc., a venture capital firm in San Francisco, said the company may be racing back to its Bridge days, before management decided to go head-to-head with Novell, Inc. "That would be doing the right thing," Whitman said.

"It's time to close the book on the old management's goal to dominate the network operating system game," he added.

"Their hardware is fine," Bo Reahard, president of Sunrise Computer Systems, Inc. in Atlanta, said of 3Com. "Their bridges and routers are competitive, but they don't have much of a market presence."

Scholz said he doubts the firm can compete in networking hardware. Already, names such as Compaq Computer Corp. and Netframe Systems, Inc. are beginning to dominate the high-end server arena. And products by Cisco Systems, Inc., Wellfleet Communications, Inc. and Vitalink Communications Corp. are better known to users of bridges and routers.

Saur said he is already looking at other vendors' so-called superservers and diskless machines incorporating Intel Corp.'s 1486 chips.

Whitman said he is confident the company can rebuild its internetworking product line, as long as it goes back to selling its systems in bundles through value-added resellers.

In the meantime, resellers themselves are uneasy about 3Com's apparent willingness to license away key technology. John Tsokatos Jr., president of

Continued on page 50

Faces of 3Com

1979: Founded by Robert Metcalfe, a principal inventor of Ethernet, 3Com Corp. sets up shop as a board maker.
1983: Firm branches out into file servers.
1984: 3Com goes public, raising $10 million.
1985: First token-ring products ship.
1986: 3Com ships its first network operating system, 3+.
1987: 3Com pushes into enterprise systems, purchasing Bridge Communications, Inc., a bridge and router company. Also teams up with Microsoft Corp. to develop and market OS/2 LAN Manager.
1988: Augmenting enterprise approach, 3Com buys Systems Network Architecture developer Communications Solutions, Inc. (CSI).
1990: 3Com unwraps remote and local internetworking products. This month, citing poor return on investment, 3Com tells managers it will hand over LAN Manager to Microsoft, try to sell CSI and recast itself as a "global data links" company.

ICL may transfer expertise to Japan

BY MOHAMMED ALKAMA
SPECIAL TO CW

PARIS — If excluded from European research programs, UK-based International Computers Ltd. (ICL), purchased last summer by Japanese giant Fujitsu Ltd., said it will invest its know-how in Japan.

"In the computer industry, one manages with the head and not with the heart," said Peter Bonfield, managing director of the Anglo-Japanese firm, in response to Europeans who have been critical of the Fujitsu takeover.

At a time when European manufacturers are questioning their futures, Bonfield said ICL found no purely European answer. Only a Japanese manufacturer, he said, was able to offer the firm a way to meet its ambition of doubling its size during the next six years.

Committed to remaining a European manufacturer, ICL will repatriate in March the production of high-end personal computer compatibles, which were, until now, manufactured by Taiwan-based Acer Technologies, Inc.

ICL also plans to develop a vast, indirect European sales network largely targeting the banking and distribution arenas. Bonfield refused to comment about whether this distribution network would include products from Japanese vendors.

ICL's new strategy will focus on the development of open systems, database integration and its presence in the networking market, he confirmed.

Top 3 priorities

These three priorities correspond to the commitments ICL made to the 40 work groups of the European Community's Esprit research project.

ICL participates in an artificial intelligence research center as well, created jointly with France's Groupe Bull and Germany's Siemens AG.

Regarding its possible expulsion from these programs, ICL is said to be prepared to assume its responsibilities and respect its commitments, which include not disclosing research results from the parent company.

Generating 30% of its turnover outside the UK, ICL needs Fujitsu as much as Fujitsu needs ICL, especially with the coming single European market. At the moment, no formal distribution agreement links ICL and Fujitsu, Bonfield said.

However, the two companies are currently working through the final stages of their new automated cash registers and bank distributors.

Alkama writes for Le Monde Informatique, *an IDG publication based in Paris.*

Typewriting on wall says PCs are it

BY RICHARD PASTORE
CW STAFF

After several abortive attempts in the early 1980s, typewriter manufacturers are again stretching beyond the narrow margins of word processing machines into the realm of personal computers. Smith Corona Corp. recently announced a new line of PCs, and late last month Somerville, N.J.-based AEG Olympia, Inc. launched its own line of IBM Personal Computer compatibles.

Olympia and its fellow office equipment makers have read the typewriting on the wall. "Typewriters are a shrinking market," said Dale Pritchett, vice president of Olympia office systems. Adding a line of PCs "is a necessary change for our dealers and for us," he added.

Olympia launched a not-quite-compatible PC in 1983 and watched it sink. Now the firm is back with a line ranging from an Intel Corp. 80386SX-based laptop to an Intel I486-based tower.

Analysts are uncertain about this second wave's chances. "It has yet to be seen whether typewriter dealers have the skills and the customer base to sell PCs," said Mark Levitt, an analyst at International Data Group in Framingham, Mass.

Olympia's parent company, Germany-based AEG Olympia Office GmbH, was also doubtful, so it hired outside computer people to build its PCs and design the marketing plan.

Pritchett views *typewriters as 'a shrinking market'*

Olympia's greatest strength in this overcrowded market will come from loyal dealers and a large financing division. Pritchett pointed to 1,600 U.S. dealers, many of them exclusive Olympia dealers for decades. Forty percent already sell some type of PC, he said.

AEG Olympia's own credit service, Mercedes-Benz Credit Corp., is already set up to provide financing for dealers and customers, Pritchett said. This may be key, because budgetary pressures will help spur corporate PC leasing next year, according to Technology Investment Strategies Corp. in Framingham, Mass.

Two local IBM headquarters replaced with trade areas

BY NELL MARGOLIS
CW STAFF

The streamlining and cost-cutting campaign that has slimmed IBM to 92% of its 1986 work force and redeployed 65,000 employees in largely sales and service-oriented directions touched down recently in Boston and Minneapolis, where headquarters operations were closed down and replaced with "trading area operations."

In place of headquarters staff, the Boston and Minneapolis locations will now host trading operations personnel, an IBM spokesman said.

Trading areas are defined by IBM as "organizations developed around a defined geography — a major city, combination of cities or state — or an industry sector." Each trading area is staffed by "a cross-functional team of marketing, service and professional services people and headed by a general manager."

Familiar faces

In some instances, he noted, the faces will remain the same; only the jobs will change. "The whole idea is to get these folks closer to the customer and to save costs," he said. Customers, he added, should see anything from no difference to an improvement in service as a result of the redefinition.

The trading area concept, defined variously along individual city or geographical region lines, is still in its formative stages, the spokesman said.

Prototype trading areas have been up and running for the past 18 to 24 months in Columbus, Ohio; Indianapolis; Denver; Raleigh, N.C.; Austin, Texas; Phoenix; and Puerto Rico. By the end of 1991, the spokesman said, IBM hopes to have some 70 trading areas in full swing.

Boston headquarters operations have been folded into the firm's New York headquarters; Minneapolis headquarters jobs will now be served out of Dallas. IBM denied reports of a similar folding of its Los Angeles headquarters into the firm's San Francisco headquarters.

The spokesman was emphatic in stating that the moves are not a part of the firm's voluntary retirement program and are not aimed at generating attrition.

3Com

FROM PAGE 49

Professional Systems Group, Inc. in Racine, Wis., said his clients have "grave concerns" about the "mixed messages" 3Com is perceived as giving.

Tsolatos said users want to know what the firm plans to keep. "I wouldn't be surprised if Microsoft licensed 3Com's demand-protocol architecture and other software . . . to meet the promises it made for 1991." Demand-protocol architecture was developed by 3Com to switch protocols on demand on a server the way a compact disc player switches discs on command.

3Com will only become a tougher sell to customers if bits are sold off. According to Reahard, "3Com's dedicated file server's strength had a tight marriage with 3+Open."

Index turns to Sage

CAMBRIDGE, Mass. — Trailing takeover rumors and facing disappointing fourth-quarter results, computer-aided software engineering (CASE) tool vendor Index Technology Corp. announced its impending merger last week with Rockville, Md.-based Sage Software, Inc.

The deal will create a company that offers what officials claim is a range of complementary CASE products. Sage Chief Executive Officer Kevin J. Burns will serve as chairman and CEO; Index head Richard A. Carpenter will remain vice chairman and chief strategist.

Analysts questioned whether the combination can recapture momentum. Index's Excelerator line once dominated the IBM-based front-end CASE tool market; however, "Knowledgeware [Inc.] has been taking market share steadily away from them," said Scott Smith, an analyst at Donaldson, Lufkin & Jenrette, Inc.

Index is projecting a $1 million to $2 million loss on sales of $11 million to $12 million for its quarter ending Dec. 31.

Smith noted there are product line synergies in the combination that unites Index with Sage. "The challenge ahead is clearly to get momentum going in the face of some pretty stiff competition," he said.

NELL MARGOLIS

INTERNATIONAL BRIEFS

Musical chairs

Management shifts in the $4 billion, New York-based **Siemens Corp.** have been initiated by German parent **Siemens AG.** Horst Langer, Siemens Corp. chairman and chief executive officer, will become a Siemens board of directors member in Canada and Mexico and will remain chairman. President Hans Decker will assume the role of vice chairman. Albert Hoser, president and CEO of **Siemens Ltd.** in Bombay, India, will become president and CEO.

April fool

A previously announced public offering of a block of the Japanese government's shares in **Nippon Telegraph and Telephone Corp.** will indeed take place, starting on April 1, 1991 and continuing over the next five years. However, according to business press reports out of Tokyo, the government has reduced the size of its proposed offering by 50%. Under the revised plan, it will sell 500,000 shares per year; the other half of the originally proposed 5.2 million share offering will remain in government hands.

Motorin'

Japan-based precision components manufacturer **Minebea Co.** and German motor maker **Motoren GmbH & Co. KG** are targeting a Feb. 1, 1991 debut for two joint venture companies aimed at the hard disk drive spindle motor market. According to their game plan, a German joint venture to be called **Papst-Minebea-Disc-Motor GmbH** will carry out product and process development as well as the setup of manufacturing facilities for its Thailand-based sister company, **Papst-Minebea-Disc-Motor Thailand Ltd.**

Anything worth doing is worth doing twice

Japanese giant **Kobe Steel Ltd.** has made its second capital investment in Longmont, Colo.-based **Prairietek Corp.**, inventor of the 2½-in. hard disk drive. The strengthened trans-Pacific partnership gives Prairietek $14 million to bolster its growth, including a new Singapore operation. Kobe, whose investment in the disk drive vendor now totals $19 million, gets a 24% voting interest in the company and a seat on the board.

MRS finds niche amid Japanese TV market

BY SALLY CUSACK
CW STAFF

CHELMSFORD, Mass. — When MRS Technology, Inc. was formed in 1986, the Japanese had 80% of the world market for television sets.

No, MRS does not manufacture televisions; it manufacturers wafer-stepper systems: sophisticated components of the flat-panel display screen construction process.

"When we got started, we anticipated doing most of our business with Japan, where four of the world's largest TV display makers are located," said Jack Steele, chief financial officer of MRS.

He added that from the beginning, a key component in MRS' strategy was to find a Japanese business partner that would also be willing to take an equity investment stake in the fledgling company.

MRS executives really wanted a manufacturing company as opposed to a trading company, Steele said, and in September 1987, the founders struck an agreement with Japanese manufacturer Dainippon Screen Manufacturing Co.

Dainippon owns between 20% and 25% of MRS and is responsible for distributing the MRS Panelprinter system in Japan. Undaunted by stiff competition from industry giants Nikon, Inc. and Canon, Inc., Steele said MRS is just "emerging into profitability. We're just about at the cash break-even point."

The company hopes to distinguish itself from its competitors with a new robotic component that eliminates the need for human loading during the display assembly process. It is essential that the integrated circuitry on the flat-panel wafers remains dust-free, and human interaction increases the possibility of outside contamination.

"If a flake of dust gets into a chip, it would cause malfunctioning," said Chris Bohner-Miyachi, a software engineer at MRS. "The whole purpose of the robotics element is to keep things cleaner."

There are currently between 6,000 and 8,000 wafer-stepper systems installed around the world. In addition to the Dainippon agreement, MRS has also contracted with Semitec Semiconductor Equipment GmbH for European distribution and with Taesan Engineering Co. for the Korean market.

Survival tips for the coming year

Defensive planning helps you ride out lean times without being laid off

BY ALICE LAPLANTE
SPECIAL TO CW

You are the information systems manager of 20 programmers and analysts, and you have just been told you have to cut your staff down to 10. Or worse, you are one of the programmers on the chopping block.

With the economic forecast for 1991 looking grim, systems personnel need to take a long, hard look at themselves to ensure that if a layoff does occur, they will remain on the payroll.

The following are 10 survival tips culled from IS managers and technical recruiters who foresee a weakening economy in 1991 and technology that refuses to stand still.

1 Develop strong personal computer skills. What many IS managers say could be the most essential survival skill is also what can threaten longtime IS employees the most: PC experience.

"This is your No. 1 survival skill," says Jim Webber, president of Omicron, a consortium of 60 major U.S. corporations formed to help members use computer technology most effectively.

The most endangered species is Cobol programmers who never learned to use the PC because they thought it was a toy. Now, it's quite apparent that PCs are not toys, and they are replacing the world that Cobol programmers know. These programmers have to change if they want to survive, Webber says.

2 Learn about graphical user interfaces. With graphical user interfaces becoming increasingly popular, experience in programming for Presentation Manager, Microsoft Corp.'s Windows, Motif, Nextstep or any of the ever-increasing numbers of graphical user interface alternatives cannot hurt.

Graphical user interfaces have become popular, because companies are finding that they help increase employee productivity and decrease training costs. Not only are more PC applications with graphical user interfaces coming out, but many firms are also tacking graphical front ends onto their mainframes.

3 Become a connectivity expert. Connectivity is another key area: Programmers and analysts who have experience tying together machines from different vendors are going to be in high demand.

"The ability to build and operate a network, to make sure that IBM mainframes work with Sun workstations, DEC VAXs, Compaq PCs and Apple Macintoshes makes an individual valuable," says Roger Wilkerson, president of Search Specialists, a recruiting firm in San Jose, Calif.

4 Get downsizing experience. Downsizing — the porting of applications formerly on mainframes and minicomputers to workstations, PCs or distributed environments — will be a hot trend in 1991, according to industry watchers. The main reason is that downsized environments are easier to support in terms of time and money, IS managers say.

After conducting a survey, Webber found this to be true: Approximately 70% of IS budgets go into maintaining existing mainframe-based systems in most companies.

"If you can figure out a way to perform the current IS function more efficiently and productively on smaller systems so that overhead costs can be driven down, you will endear yourself to management," Webber says.

5 Master a broader range of skills. When the pressure is on the IS manager to lay off workers, the ones who can wear two or even three hats will be most useful and most likely to be retained on the payroll.

"It sounds obvious, but when it's time to make that hard decision, the more versatile employee is going to look the most attractive," says Gary Newman, MIS director at Arter & Hadden, a Cleveland-based law firm.

6 Be aggressive in applying technology to your company's business problems. Sean Meighan, head of systems operations at Sequel Corp., a disk-drive maker and former Unisys Corp. subsidiary, says he and his staff regularly attend business unit meetings on such topics as process manufacturing and quality control. Then, whenever a problem is discussed that has a possible systems solution, Meighan says, his employees can independently come up with answers that meet the business needs and present them to the appropriate line managers without being prompted.

7 Work on your communications skills. Newman was recently forced to lay off 20% of his systems staff to meet 1990 operating expense targets, even though the firm itself grew 25% this year.

The employees who survived the cut were the ones who communicated best with systems and nonsystems management and staff members, Newman says. "The ones I kept on were technically excellent programmers, but they also let people know what they were doing," he adds.

8 Get closer to end users. IS managers say it isn't enough simply to talk to managers. Getting to know individual workers in functional departments throughout the organization is equally essential; these are, after all, the people who have to use the applications you develop.

"A lot of mainstream MIS professionals are getting dropped by the wayside because they don't have the skills to deal with end users in a practical, positive way," Webber says.

9 Know your organization's business goals and objectives. "One of the reasons that my group is successful is that we do not consider ourselves programmers," Meighan says. "Our goal is the same as the company's: to raise manufacturing volume, but at the same time, to never ship a defective product. Everything else follows from that."

10 Think constantly of your career path. Finally, no matter how secure you think your job is, you should always be thinking several years ahead in terms of career planning.

"Don't expect to be spoon-fed career options," Webber says. "Always be on the lookout for options."

LaPlante is a free-lance writer based in Palo Alto, Calif.

Money Isn't Everything.

When it comes to the overall picture of professional employment, salary isn't the only major factor.

As a manager, you'll appreciate the **1991 SALARY GUIDE** from the *Robert Half* and *Accountemps* organization. It offers a comprehensive view of the nationwide current salary levels in Information Systems, Accounting, Finance and Banking key positions.

© 1990 Robert Half International Inc.

We've added more comprehensive information on issues like employee retention, hiring new staff and controlling compensation costs.

Call your local *Robert Half* office for your FREE 1991 SALARY GUIDE or complete the coupon below!

ROBERT HALF INTERNATIONAL
P.O. BOX 883128
SAN FRANCISCO, CA 94188

Please send me a complimentary copy of your 1991 SALARY GUIDE.

Name _____
Title _____
Firm _____
Address _____
City/State/Zip _____
Telephone ( ) _____

S591-In

ROBERT HALF
Specialized Recruitment For The Information Systems Profession

SAUDI IRON and STEEL COMPANY

HADEED

Our Saudi Arabian client offers an excellent employment package including 2-year renewable employment contracts, free accommodations, medical benefits, car allowance, return air tickets, 8 weeks annual vacation, attractive salaries, completion bonus, assistance with schooling, etc. All in a pleasant Gulf coast atmosphere.

Due to expansion of facilities and developments in management information systems, mature and energetic COMPUTER SPECIALISTS are needed to fill the following positions:

BUSINESS ANALYST

To conduct structured business analyses producing documentation reflecting users' needs. This documentation will form the base for systems development or for computer package evaluation. To control systems testing, implementation and the development of user procedures for manual and computer systems.

Candidates should have a minimum 5 years experience in the areas of Accounting and Financial systems. Manufacturing environment desirable.

END-USER COMPUTING SECTION HEAD

To supervise a group responsible for support of auxiliary systems including PC's, graphics and word processing. To evaluate hardware and software requirements for support systems. Will have contact with users and management.

Candidate should have a minimum of 5-years relevant experience. Working knowledge of all PC Hardware components and major software products. Should include knowledge of popular PC brands (IBM, AST, COMPAQ, SEAGATE, etc.) and NOVELL LAN configurations. Excellent oral and written skill required.

DATA PROCESSING QUALITY ASSURANCE ANALYST

To monitor departments adherence to procedures, documentation standards and systems development methodology. To review their additions,changes, and deletions.

Five years experience working in a structure analysis environment that emphasizes standards with responsibility for standard review and documentation. Technical writing experience with responsibility for standards review and maintenance a plus.

DATA BASE ADMINISTRATOR

To perform all administrative, application and technical functions for the management of the company's data base systems. This will include data modelling, selection of new data base systems, and technical support of current data base systems.

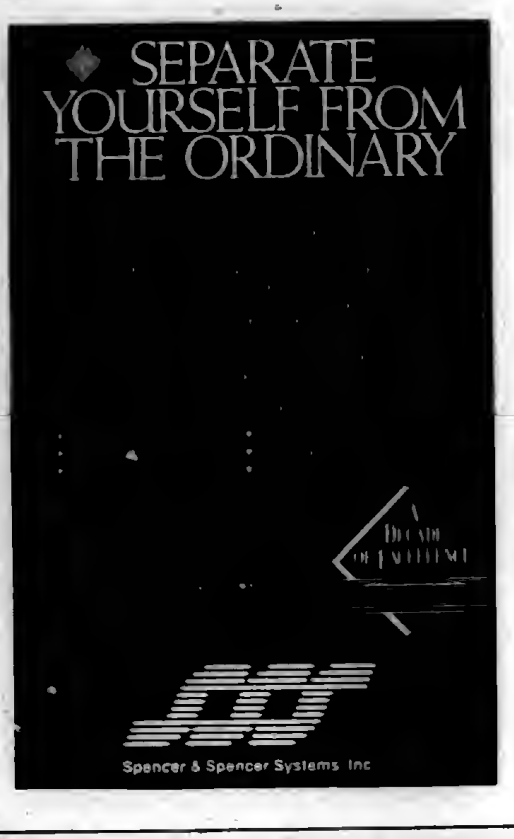
Candidate should have a minimum of 5 years relevant experience in a CODASYL database environment. Experience with relational databases, PRIME's DBMS and PRIME INFORMATION desirable.

PROGRAMMER ANALYST

Senior member of development team on the specification, programming, and implementation of a variety of manufacturing, accounting, and MIS systems. Candidate should have a minimum of 5 years recent experience in COBOL, online and database systems. Machine used is Prime 6350. Degree required.

Please send your resume and salary requirements to:

SEARCH INTERNATIONAL
Attn: Paul E. Kenkel
UNIVERSITY TOWER, 4199 Campus Drive, Suite 900
Irvine, California 92715



CASE Professionals

As America's leading CASE recruiting firm, Halbrecht & Company has developed solid relationships with CASE tools vendors, consulting firms and end-user clients. Permanent positions located throughout the U.S. exist now with these companies. Currently we are seeking qualified professionals for the following positions.

Information Engineers (BAA-BSD)
Senior Consultants/Systems Analysts
Sales Engineers/Analysts/Account Reps
Product Developers/Modelers/Architects
Planners/Managers/Methodologists

Our clients look for 5-15 years experience, BS/MS degree, ability to travel and hands-on CASE background. Compensation is 40K to 100K with various perks. We are positioned to help many clients to fulfill their 1991 hiring plans. Send for our free JUST-IN-CASE job bulletin.

Halbrecht & Company
10195 Main Street
Suite L
Fairfax, VA 22031
(703) 359-2980
FAX (703) 359-2933

Halbrecht & Company
P.O. Box 324
Old Greenwich, CT
(203) 637-3615
FAX (203) 637-4953

Halbrecht & Company
New York, NY
(212) 982-3333
FAX (212) 599-8019

HALBRECHT & Company

AMERICA'S LEADING CASE RECRUITER

Director of Information Services

The Medical Center, a 417 bed teaching hospital located in Columbus, Georgia, has a career opportunity for a seasoned DP professional to lead our info services departments. This position is the key resource person for MIS within the organization and will proactively manage and integrate all information systems projects. The ideal candidate will have a Bachelors Degree in a relevant discipline, a minimum of five years management experience in a comparable health care environment, IBM mainframe and SMS experience.

The Medical Center offers a competitive compensation and benefits package and an unequaled work environment.

For confidential consideration, please submit resume with salary history to

The Medical Center, Inc.
Attn: Human Resources
P.O. Box 951
Columbus, GA 31994-2299

Equal Opportunity Employer

DMI Celebrating Twenty Years of Providing Total Business Solutions to Major Corporations Throughout the Southeast

PROMOTE YOURSELF!

Dynamic employment/consulting firm has new requirements for both permanent positions and consulting assignments for Programmer to Sr Programmer Analysts. State-of-the-art environments, with salaries from $35,000 to $55,000, and rates from $25.00 per hour, dependent upon expertise. Software includes:

VAX: NATURAL	IBM: IMS DB/DC
FORTRAN/FMS	IDMS/ADS-O
INGRES	DB2, CSP
ORACLE	NATURAL
RDB	DB2, SQL

Call or send resume to
Permanent Placement: **Dana Binkley**
Contract Assignments: **Kelly Birmingham**

DMI DataMasters®
P.O. Box 14548, Dept. CW
Greensboro, NC 27415-4548
(919) 373-1461 OR 1-800-326-3367
FAX 1 (919) 373-1501

SINCE 1971 NATIONALLY AFFILIATED EOE
• Ask about our all-new 1991 Salary Survey •

CICS/DLI PROGRAMMERS

- BE RECOGNIZED
- BE CHALLENGED
- PARTICIPATION

Diversified Employee Owned Company
***Call* 1-800-552-CMSI**
CMS Computer Management Sciences, Inc.
8003 Baymina Rd., Jacksonville, FL 32256, Dept. CW A191

SR CAD/CAT Hardware Engineer. Responsible for the Research, Development, prototype & evaluation of Computer Aided Design/Computer Aided Test (CAD/CAT) processes for digital circuit designs implemented in Very Large Scale Integrated Circuits (VLSI). Responsible for the selection, evaluation, process development & model development of Computer Aided Design tools incorporating design & fault simulation, logic synthesis using the Berkeley OCT tool suites, automatic test pattern generation, test sequence generation, Register Transfer Level (RTL) behavioral modeling using Hardware Programming Language (HPL) & semiconductor layout, including gate array channel routing utilizing a knowledge of digital electronics design architecture design modeling in VHDL, design verification & test generation, design layout for semiconductor logic, software specification & development in C programming language using UNIX & ULTRIX & with Knowledge base design using LISP & PROLOG technology. Integrated CAD tool suites such as the OCT tools from the University of California at Berkeley, & Stanford RISC architecture. Requirements for this position are: A Ph.D. in Electrical Engineering with background in CAD/CAT tool, fault simulation, Automatic test pattern generation, Logic synthesis including the Berkeley OCT tool suite, behavioral modeling using HPL, VHDL, Stanford RISC architecture, Knowledge of C, UNIX/ULTRIX, & knowledge based design implementation & languages including LISP & PROLOG. Salary $60,000.00 per year. No exp. req. 40hr/wk. 8:45am-5pm. If you are interested in, & qualified for the above position, please forward two (2) copies of your resume to: J.O. #1146, Commonwealth of Massachusetts, Dept. of Employment & Training, Special Programs, First Floor, 19 Staniford St., Boston, MA 02114.

Systems Analyst, 40 hours/week, 8:00 a.m. - 5:00 p.m., $36,871/year. Job requires: Masters degree in Industrial Engineering or Computer Science and 6 months experience as a University Research Assistant or Industrial Engineer or Systems Analyst. Job also requires: 1) 1 grad. course in which SLAM simulation language was studied; 2) 1 grad. course in linear programming; 3) 1 grad course in advanced production control and 4) 1 grad course in data structures for CIM (Computer-aided Integrated Manufacturing). Job duties: Develop mathematical algorithms and models to improve the efficiency of production systems using discrete event and continuous simulation, linear programming, dynamic programming, and queuing theory. Implement newly developed models on computer systems. Interface Discrete-Event and Continuous SLAM simulation language with FORTRAN to develop simulation models of production systems. Use group technology to solve production problems. Qualified applicants should send resume and verification of requirements to: 7310 Woodward, Room 415, Detroit, MI 48202. Reference #92380. Employer Paid Ad. An Equal Opportunity Employment-Paid Advertisement.

COMPUTER SPECIALISTS OUR ONLY SPECIALTY

Experienced in Engr'g or Programming? We match you to the job you want. All USA Locations/All fees paid. Mail resume or call to discuss your career goals.

TECH SUPPORT
IBM & DEC
SOFTWARE
C UNIX Assemblers
PROG/ANALYSTS
IBM MF Drive & Menu
CICS RPG DOS/VS Databases
HARDWARE
Analog/Digital
COMMUNICATIONS
Voice & Data

HAMILTON
P.O. Box 399
West Nyack, N.Y. 10994
(914) 679-4550

PROGRAMMERS
Contract Assignments
The next is the best!
Sr. & Jr. Level
Jr. to Sr. level programmers with 1+ yrs. exp. in IBM, "C", PL-1, ASSEMBLER, & other high-level languages. Contract assignments 12-18 mos.+ $24-28/Hr. + per diem +
Contact Al Stokes, C.E.C. CORPORATE PERSONNEL CONSULTANTS, INC.
P.O. Box 221730
Charlotte, NC 28222
(704) 366-1600
FAX (704) 366-0670

Senior System Software Engineer, Applications Group. By February 1, 1991 please send resume to: Employment Security Department, ES Section, Attn: Job # 2400687-W, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and subsystems for micro computers. Assumes lead responsibility to design, implement and test user interface components for Word 5.1 and 6.0 utilizing OS/2, MS-DOS and Windows operating systems and "C" and Assembler 3rd-gen languages. Designs, implements and tests advanced word processing features including menu driven programs and color sets. Assumes major project responsibility including 1) requirements and analysis of project specifications, 2) product design, and 3) implementation schedules. Requirements: M.A. or M.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience utilizing multitasking, windowing and MS-DOS operating systems, and "C" and Assembler 3rd-gen languages, and developing, testing and implementing user interface components including menu driven programs and color graphics. 20 college hours in computer graphics. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary: $37,500-39,000 per annum, including 40 hours per week, flex time. EOE.

Four or more ACP/TPF PROGRAMMER ANALYSTS required. Design and develop new ACP/TPF applications in a real time environment. Design of system functionality, coding, testing, and implementation. Assist programmers and other analysts in program applications, design, test and implementation of new software. Ensure that software and system standards are maintained according to the structure of an ACP/TPF environment. Design interfaces with other aspects of transportation industry. Provide system maintenance and maintain system integrity. Applicants required to have a bachelors degree or its equivalent in computers, math or engineering with at least two years ACP/TPF programming and assembler coding experience. Annual salary will be $36,000.00 per year for a 40 hour work week. Additional salary may be paid up to $40,000.00 if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5787353. This advertisement paid for by an equal opportunity employment employer.

Position Yourself for the 90's

Sales, Marketing and Pre & Post Sales Opportunities

NATIONWIDE

From Account Exec. to Vice President
From Product Mgr. to Engineering Mgr.

• Software • Hardware •
• Peripherals •
• Datacom • Telecom •

Send Your Resume or Call Today

SSi
SALES STAFFING INC
1110 Lake Cook Rd. #135
Buffalo Grove, IL 60189
708-215-0500
Fax 708-215-0267

MAINE - NH
$25,000 - 50,000
Salary

ROMAC, the largest and oldest placement agency in this area, is seeking qualified data processing professionals with salary requirments in the $25,000-$50,000 range. Our clients pay our fees.

ROMAC
Att: Dept. 2
P.O. Box 7040
Portland, ME 04112
(207) 773-4740
FAX (207) 773-2645

SYSTEMS PROGRAMMERS

Our client, a world respected F100 Corp. located in NJ has exceptional opportunities for career driven DP professionals. This profitable, stable corp offers generous salary, bonus, excellent benefits, including relo assist. Salary levels are open. Degree + 4-10 yrs exp. req.

CICS Systems Programmer Installation & tuning (MVS, Assembler/Cobb exps would be a +)

Performance and Tuning (MCS, SAS, RESTI, MXG (VM would be a +)

DATA BASE RESOURCE
18 Bank St.
Morristown, NJ 07960
201-898-8788

We Build Careers!

Immediate IBM 3X/400 Positions—Permanent & Consulting

Electronic Systems Personnel, Inc., is a full service data processing placement firm established in 1968. We were selected as the Twin Cities' leading independent computer placement specialist by National Computer Associates.

ESP Software Services, Inc., is a full service data processing consulting firm established in 1987. In just over 3 years we have become the preferred vendor in the Twin Cities for IBM mid-range requirements. If you have the following experience, we would like to talk with you about joining our team.

PERMANENT OPPORTUNITIES

P/A	3+ yrs.	RPG III. Medical Mfg.	$35K
P/A	4+ yrs.	RPG III. Small town.	$45K
P/A	3+ yrs.	RPG III. 15% travel.	$40K
Sr. P/A	4+ yrs.	RPG III. Int'l. travel.	$45K
P/A	2-4 yrs.	SYNON/RPG III.	$36K
P/A	3+ yrs.	RPG III. London.	$45K
3 pos.	2-4 yrs.	RPG III. Software Dev. Co.	$39K
Sr. P/A	6+ yrs.	RPG III. Distribution.	$45K

Please contact Russ Edwards, Rick Des-Lauriers or Bill Tabor at (612) 338-6714 for more information.

CONSULTING OPPORTUNITIES

P/A	3-4 yrs.	RPG III	$45K
P/A	2+ yrs.	RPG III	$40K
P/A	1 yr.	SYNON	$40K
P/A	2 yrs.	PANSOPHIC	$40K
P/A	2 yrs.	BPCS	$40K
P/A	2 yrs.	MAPICS	$40K
P/A	2 yrs.	J. D. EDWARDS	$40K

Please contact Christine Wisch at her direct number (612) 337-9171 for more information.

esp **esp**

Suite 1800, 701 Fourth Avenue South, Minneapolis, MN 55415
(612) 338-6714 • FAX (612) 337-9199

ELECOMMUNICATIONS

IN AN INDUSTRY THAT'S CHANGING THIS FAST, YOU HAVE TO BE AS PROGRESSIVE AS AMS.

We are one of the nation's largest independent computer systems and services firms and are best known for applying information systems technology to the complex management problems facing America's largest corporations.

For more than a decade, American Management Systems, Inc. (AMS) has provided cellular, local, and long distance telephone companies with the billing, service order and message processing systems necessary to compete in this constantly shifting market.

Our clients require systems complex enough to support the deregulated environment and adaptive enough to accommodate new technologies, yet simple enough for routine user maintenance. They expect us to use the latest in CASE technologies and provide solutions which allow for the migration to full SAA® compliance in their applications. This translates into major challenges for our staff.

We have openings in our Corporate headquarters in Washington, D.C. as well as the New York/New Jersey area, Houston, TX, Rochester, NY, and Alberta, Canada.

PROGRAMMER/ANALYSTS AND SYSTEM DESIGNERS—We are seeking Programmer/Analysts with 2-4 years, Sr. Programmer/Analysts with 4-6 years, and System Designers 3-5 years of design, analysis, programming, and testing experience. Familiarity with IBM MVS,* JCL, TSO, CICS, VSAM, IMS and DB2 is highly desirable as well as experience with large C COBOL on-line business oriented systems. Bachelor's in Computer Science or equivalent is necessary.

TELCO INDUSTRY BUSINESS SYSTEMS PROFESSIONALS—We are seeking individuals with exposure to Telco billing, message processing and/or service order systems and three or more years of business or technical experience with the analysis, design, testing and/or implementation of these systems. Experience with billing operations/production control, taxes, treatment, cash, adjustments, toll investigations and/or carrier access billing is a plus.

IMS/DBMS PERFORMANCE EXPERTS—We are seeking individuals with a minimum of 4-5 years of experience working specifically with IMS DB/DC handling both design and tuning aspects. Familiarity with logical and physical data base design is necessary as well as a working knowledge of the various IMS tools. Exposure to both the DB (data base [batch]) side and the DC (data-comm [on-line]) side in order to optimize transaction processing, set up buffer pools, and stress test a system will be essential for the critical domain of performance tuning and monitoring.

TECHNICAL EDITOR—We are seeking a Technical Editor to edit technical and user documentation ensuring format, grammatical and editorial consistency as well as to assist writers in publishing clear, concise documents in highly technical areas. Requirements include excellent analytical and communication skills and a degree in English or 4-5 years' experience in editing technical/user documentation.

We offer an attractive compensation package, three weeks vacation, and rapid career growth opportunities. For immediate and confidential consideration, send resume and salary history to: **Irene Vapp, Director of Human Resources, American Management Systems, Inc., Telecommunications Industry Group, Dept. CW-12, 1777 North Kent Street, Arlington, VA 22209.** An Equal Opportunity Employer M/F/H/V. No agencies please!

ams
AMERICAN MANAGEMENT SYSTEMS, INC

*SAA is a trademark of IBM Corporation

Data Processing PROGRAMMER/ANALYSTS

Contract Data Services, Inc. is a data processing consultant firm with offices in the Carolinas of Charlotte, Raleigh, and Winston-Salem. Our excellent reputation for providing quality programmer/analysts to our clients and for providing secure, rewarding careers to our staff members has placed Contract Data Services among the industry leaders in data processing services.

Contract Data Services, headquartered in Charlotte, offers full-time employment with competitive salaries and a superior benefits package totally funded by the company for employees and their dependents. Benefits include group health care with prescription drug cards, life, dental, tuition reimbursements, paid parking, vacation and holidays, long-term disability, bonuses, and more!

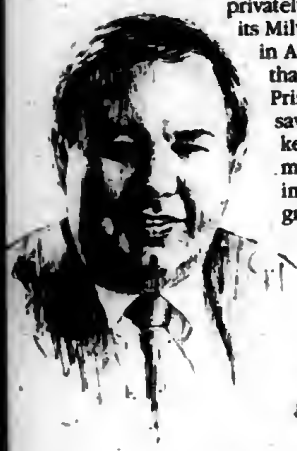
With an emphasis in the industries of banking, manufacturing, and insurance, Contract Data Services is currently seeking application programmer/analysts that have at least 3 years experience in one of the following areas:

• CICS, DL/1 • DB2/SQL/CSP • IMS DB/DC • ADABAS/NATURAL 2 •

"Computerworld delivers high quality candidates on a very effective cost-per-hire basis."

Eric Butlein
Principal
Computer People Unlimited, Inc.

Richard Weiss
Principal
Computer People Unlimited, Inc.



Richard Weiss

The largest software services consulting firm in Wisconsin, Computer People Unlimited, Inc. (CPU) is also listed in *Inc.* magazine as one of the fastest growing privately held companies in America. Together, its Milwaukee headquarters and branch offices in Appleton and Madison employ more than 250 professionals. During 1989 alone, Principals Eric Butlein and Richard Weiss saw the firm hire 98 new consultants. To keep pace with its rapid expansion and maintain its low employee turnover, CPU implements a rigorous recruitment program to hire the right professionals for every position.

"We need to recruit people through what they're reading, and Computerworld *is the most widely read weekly among computer professionals. Primarily we're looking for consultants — programmers, software engineers, and computer scientists with expertise in software development. About half of our consulting entails writing software programs for business, and a full 25% is dedicated to the area of scientific/engineering programming. Another 25% is comprised of technical services, technical writing, and end-user computing, as well as artificial intelligence, and especially expert systems. Recruiting consultants with specialized skills in these specialized markets is where* Computerworld *helps us the most.*

"The talent we need to service all our clients — in banking/finance, insurance, manufacturing, medical technology, utilities, retail, high-tech, and state/local government — isn't always available locally. Also, CPU's policy is not to hire from customers. So it's essential that we look for professionals from outside of Wisconsin. In fact, roughly 80% of the consultants we hire in the scientific/engineering area, as well as up to 30% of our business consultants, come from out of state. Here, the nationwide exposure we get with Computerworld *is crucial to our recruitment efforts.*

"Computerworld *delivers high quality candidates on a very effective cost-per-hire basis. Back in 1988, for example, a client had a specification for six very specialized professionals. There was no question — we needed* Computerworld's *powerful reach. In the end, at least two of these positions were filled with applicants generated by* Computerworld. *Because of its proven success,* Computerworld *is the only trade publication we use on an ongoing basis as part of our well-rounded recruitment program."*

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Eric Butlein and Richard Weiss. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

Eric Butlein

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
New York: Mack Center 1, 365 West Passaic Street, Rochelle Park, NJ 07662 (201) 587-0090
Washington, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. From manufacturing to banking, healthcare to insurance, Computerworld reaches the right people in every major industry.

Number of Computerworld Readers with Experience in Key Industries (Entire Career)

Job Industry	of Computerworld's Audience ...
Computer Vendor and Consulting	147,897
Computer Manufacturer	79,521
large-scale computers	37,110
medium-scale computers	45,936
small-scale computers	33,851
personal computers	47,758
technical workstations	24,889
Software Vendor	130,589
for large-scale systems	57,561
for medium-scale	74,967
for small-scale systems	61,274
for personal computers	76,787
for technical workstations	26,379
Non-CPU Computer Products Manufacturer	36,994
VAR/dealer/retailer	27,557
DP Service Bureau/contract DP Services	53,077
Consulting/planning	86,677
Manufacturer (not computers)	168,664
Insurance	52,910
Healthcare	64,729
Banking/financial Services	97,953
Government - federal/state/local	110,399
Business Service (except DP)	40,108
Communications Systems	28,913
Public Utilities	54,364
Transportation	26,031
Wholesale/retail Trade	111,095
Education	125,184

SOURCE: Skill Survey of Computerworld's Audience, May 1989

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

ELECTRONIC DATA PROCESSING SYSTEMS ANALYST wanted, Dallas. Analyzing client's data processing requirements, including billing data and marketing information requirements, then designing, developing and implementing billing and marketing database management systems to satisfy those needs in the most timely and least expensive manner using dBase III. This includes building an input/output chart describing the inputs and outputs between the various processes, then using the input/output chart to prepare full diagrams and structural charts from which the system is designed. Preparing design specifications and systems documentation and implementing the system on the client's computer system. Need a Bachelor's degree in Computer Science, Engineering or Business Administration and 2 yrs. exp. in the job offered. Pay is $32,300/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #93080. Employer Paid Ad.

HELP! HELP! HELP!
ADOW Personnel has more positions in the Mid-West than we can fill:

PROGRAMMER/ANALYSTS	35K
SENIOR P/A's	38K
SENIOR ANALYSTS	40K
BUSINESS ANALYSTS	40K
SENIOR BUS./ANALYSTS	44K
PROJECT MANAGERS	53K
MGR. MIS PLANNING	OPEN

Must Have 3 yrs. + exp. with:
- IBM MAINFRAME, S/38, AS400, DEC VAX, SPERRY/UNIVAC
- COBOL, CICS, IMS, DB2, MVS, DB/DC, UNIX, C, RPG 2&3, ORACLE, INGRES, RDB, VMS

Call ERNIE at 313-721-2389 or fax resume to 313-721-3734.

ADOW Personnel

RELOCATION SPECIALIST
IBM P/A's, S/P's, DBA'S...

I specialize in relocating DP professionals to growth areas of the United States. Fees Paid by hiring company. 15 years DP Search & Placement experience.

John Cook
COOK & ASSOC., INC.
P.O. Box 1778
Duxbury, MA 02331
1-617-934-6571

SOUTH FLORIDA IN 1991

New opportunities for seasoned DP professionals including:

MIS, DBA's & Sr P/P's	To $60K
AS 400 Tech Spec	To $60K
P/P's	To $50K

All levels w/IBM 3090, AS 400, PC

PC Network Mgr	To $60K
Systems & Prog Mgr	To $50K

Sys 36/AS 400 "hands-on"

Inquire about corporate relocation packages. Contact Ilet Lowenberg

STEVEN DOUGLAS ASSOCIATES
3850 Hollywood Blvd. Suite 300
Hollywood, Fl 33021
(305) 962-6666

WANTED: DEAD OR ALIVE CONSULTANTS

MO, KS, NE, IA, IL
JMRoss & Assoc., Inc
PO Box 1734, St. Louis, MO 63043
314-434-1976 / FAX 434-0952
NACCB Member

COMPUTER SCIENCE FACULTY
ASSUMPTION COLLEGE
Worcester, Massachusetts

Full-time, tenure-track, teaching undergraduates 12 hours (3 preparations). Begin September, 1991. Master's/Computer Science required. Teaching experience and Ph.D desirable. Salary and rank negotiable. Excellent benefits. Candidate must be able to support the Catholic liberal arts character of the College. Send letter and resume by February 10, 1991 to: Dr. Vincent Clothier, Assumption College, 500 Salisbury Street, Worcester, Massachusetts 01615-0005. AAEOE.

$600 Million 1993
$266 Million 1989
$101 Million 1985
$44 Million 1982

Our Future Has Never Been Brighter

Policy Management Systems Corporation is a rapidly growing 300+ million dollar international corporation, with 4000+ employees and over sixty offices in the U.S. and fourteen foreign countries, that has provided software products, computer processing and insurance services for the insurance industry since 1974.

PROGRAMMING OPPORTUNITIES
Columbia, South Carolina

Continued growth in the U.S. and International markets has created several opportunities at our Corporate Headquarters.

• Programmer Analysts
This is an excellent growth opportunity in our state-of-the-art environment using COBOL, CICS, "C" and IBM's OS/2 Presentation Manager. Hardware consists of IBM 3090, AS 400, PS2, related peripherals and auxiliary equipment.

Experience in a property and casualty OR life insurance environment a plus.

We offer a competitive compensation and benefits package as well as the opportunity to learn and work within a rapidly growing, financially stable, service oriented company. Relocation packages are available.

For immediate consideration, call Philip Hughston at

1-800-833-PMSC

or send your resume in confidence to:

Policy Management Systems Corporation
P.O. Box Ten
Columbia, South Carolina 29202
Attn: Philip Hughston

Equal Opportunity Employer M/F

COMPUTER PROFESSIONALS

Benson, Douglas & Associates, Inc. is an established leader in the Information Technology Services consulting industry. Our steady growth has created the need for us to expand our staff. BD&A offers a diversity of projects with opportunity for advancement to such positions as Project Manager and Field Support Manager. We offer an exceptional benefits package that includes major medical, dental, 401K and profit sharing. Current requirements are:

IBM - CSP, TELON, CICS, COBOL, DB2, ADABASE/NATURAL,PC-MS/DOS-C, AS/400 - RPGIII, SYNON, TECH/WRITERS, DRAWMASTER ETC.

VAX - VMS-C, SMARTSTAR, ORACLE, INGRES, SYBASE, SAS, UNIX-WINDOWS, MOTIF

HP/3000 - COBOL, FORTRAN, SPL, ASK, SPEEDWARE, MM, PM, PROTOS, TRANSACT, POWERHOUSE

HP/9000 - HPUX, C, UNIX, X-WINDOWS, MOTIF

Call, mail or fax resumes and salary requirements to: **(Please reference CW0191)**
113 Edinburgh South, Suite # 104
Cary, North Carolina 27511
Attention: Jim Hunt or Bill Hood
Phone# (919)467-3307 or (800)525-3927
Fax# (919)467-7688

bd&a

AN EQUAL OPPORTUNITY EMPLOYER

Computer Systems Analyst wanted to analyze complex systems requirements, and, design, develop and support of Litigation System for Department of Transportation and Worker's Compensation System for Department of Labor of State of Michigan on UNISYS A Series mainframes using SDM/70 Methodology, LINC, 3GEN, QRI, GH, MCP, COMS, SDF, MAPPER, COBOL, DMS II, PATHVU, RETROFIT, WFL and MICROPROCESSOR ASSEMBLY LANGUAGE. Requires Bachelor's degree in Electronic Engineering or Computer Engineering and one year experience. $36,000.00 per year. 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #97190 "Employer Paid Ad"

COMPUTER PROGRESS UNITED

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for P/A in Kentucky, Ohio, Indiana, and Tennessee. We are the DB2 Specialist!

TELON
DB2 • IMS • CICS

Send resume or call
Computer Progress United
12720 Townsend Way
Louisville, KY 40245
(502) 245-0933

"...The quantity and quality of responses we've gotten from Computerworld have been better than those generated by any other form of advertising we've tried."

— Bob Stevenson
President
CIBER

Consulting comes first at CIBER — and that's even reflected in their name. CIBER stands for Consultants in Business Engineering and Research, a national company that's been providing top consulting services to the information processing departments of business and government clients since 1974.

In order to deliver superior services, the company needs to attract qualified consultants. And from there, CIBER — like any other business — needs to market itself to clients. CIBER meets both challenges with *Computerworld*, says company President Bob Stevenson.

"CIBER demands the most when it comes to hiring consultants, just as clients demand the most from consulting services. In addition to being technically competent, CIBER consultants should have both a professional attitude and a commitment to our clients.

"To attract this calibre of consulting talent, we go to the same source we use to attract clients — Computerworld.

That's because we know Computerworld *is effective. We get national exposure to potential client companies, and we recruit highly qualified professionals for our consulting positions.*

"In both instances, the quantity and quality of responses we've gotten from Computerworld *have been better than those generated by any other form of advertising we've tried. We're definitely seeing a high return on our investment with* Computerworld.

"The bottom line is that Computerworld *works well for us. So we'll continue to rely on* Computerworld *as an important — and effective — part of our future."*

Computerworld. We're helping serious employers and top computer professionals get together. Every week. Just ask Bob Stevenson.

For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

COMPUTERWORLD

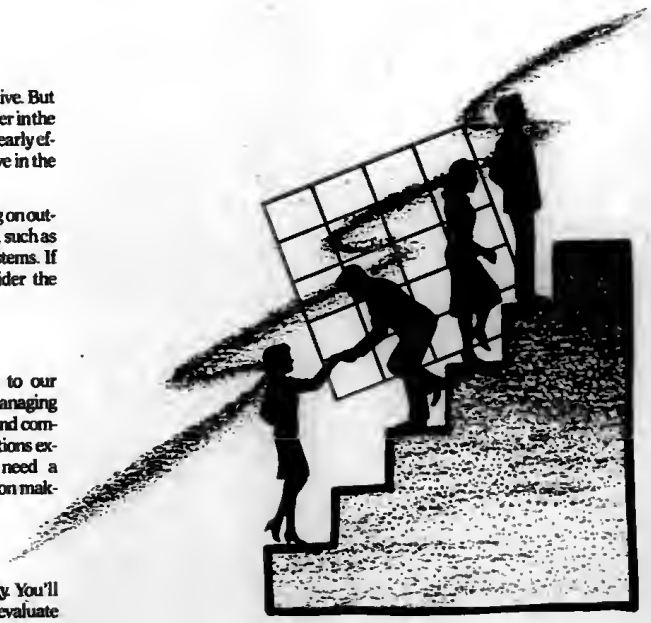
The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701 9171 (508) 879-0700
New York: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090
Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

Since 1956, we've been committed to the best in automated systems.

How's that for on-line opportunities?



You may not think an insurance company can be daring or innovative. But when it comes to technology, that's exactly what SAFECO is. A leader in the financial services and insurance markets, SAFECO pioneered the early efforts to apply computer technology to business tasks—a bold move in the 50's, when computerization was still in its infancy.

Of course, we haven't maintained our leadership position by relying on outmoded technology. We're continuing to venture into new territory, such as the use of advanced office automation technology and expert systems. If you're ready for a challenging opportunity at SAFECO, consider the following:

Manager of Network Control

You'll be responsible for all aspects of network availability to our customers. This will involve overseeing supervisors and staff, managing projects, recommending vendors, and handling financial analysis and communications planning. We require 5+ years' of data communications experience in a customer service environment. You'll also need a management/supervisory background as well as excellent decision making and interpersonal skills. IBM/SNA experience preferred.

Systems Analyst

Coordinate the definition and implementation of our LAN strategy. You'll also develop our integrated office automation environment and evaluate applications, initially targeting OfficeVision. You'll need a strong background in requirements definition and knowledge of office automation technologies. Excellent communication and planning skills essential. Experience in all phases of applications development preferred.

Programmer Analysts

We're looking for experienced programmers who enjoy working in a team environment with state-of-the-art equipment. As a programmer, your charter will be to design, spec, code, implement, and enhance SAFECO's various systems. To qualify, you must have 1–4 years' COBOL applications experience in an IBM, 30XX, OS/MVS, and IMS DB/DC capacity.

Technical Analysts

Openings exist in the following areas:

DB2

We're seeking a DB2 specialist to support logical data modeling, database recovery and backup, and the conversion of DL1 to DB2. You'll also produce the physical database design and define DB2 objects, as well as handle database tuning, QMF support, and library management. Requires DB2 experience in application programming, database performance, and utilities. You'll also need analysis skills emphasizing data modeling and physical definition of DB2 databases. QMF experience and a customer service orientation also required.

PCs

As a PC specialist, you will provide technical support to users of DBase, Lotus, WordPerfect, Volkswriter and DOS. This includes performing some BASIC programming; reviewing hardware and software acquisition requests, handling troubleshooting, and doing some product research. To qualify, you'll need 2–5 years' related experience in an IBM environment; a knowledge of listed software is a plus.

Networks

Responsible for reviewing proposed network changes, you will work with vendors on equipment proposals and manage LAN operating software such as Novell and Token Ring. This position in our Technical Systems Support Department requires an understanding of data networks, including wiring and protocols. Must also have a demonstrated analytical ability and knowledge of voice networks.

For your efforts, we will reward you with an outstanding compensation package, and an environment conducive to professional success. For immediate consideration, please send your resume to SAFECO Insurance Companies, SAFECO Plaza, Seattle, WA 98185. Attn: Kathie Ledger. Or, you can call Kathie at (206) 545-6142. You may also FAX your resume to Kathie's attention at (206) 545-5293. SAFECO is pleased to be a leading Pacific Northwest equal opportunity employer.

SAFECO®

Finding a better way in financial services.

COMPUTER CAREERS

CASE Consultants

Claremont Consulting Group, Inc. has numerous openings for experienced developers who have hands-on experience with either IEF™ or PACBASE. Our employees receive outstanding compensation, excellent benefits and opportunities for growth.

IEF Consultants will work at client sites in California and Oregon. Positions are also available at our Development Center in Portland, OR. To qualify for one of the following positions, you must have hands-on experience with the IEF™ tool as well as structured business systems analysis experience:

- Project Manager
- Strategic Planning Consultant
- Business Systems Analyst
- Business System Designer
- Development Center Instructor

PACBASE consultants will work at client sites in the Mid-West or at the Development Center in Portland. PACBASE coding experience is required for all positions:

- Systems Analysts
- Programmer Analysts
- Programmers
- Project Leaders

To learn more about your potential for an exciting future with a group of formidable players in the CASE arena, call Sally Morris at 1-800-366-8592.

claremont
Consulting Group, Inc.

15201 N.W. Greenbrier Parkway, Suite A-2
Beaverton, OR 97006
FAX (503) 690-9211

UNIX-"C"

Atlanta, Georgia

Our client, a major Fortune 500 company, is in need to fill approximately 20 Programmer/Analyst positions immediately. These positions will be all new development, utilizing UNIX-"C".

Qualified applicants must possess:

- 2+ years' UNIX-"C"
- ***Must be bilingual - English-Japanese***

Relocation assistance will be provided.

Please respond in confidence to:

MICHAEL JAY ASSOC. INC.
201 Route 17 North, Suite 300
Rutherford, NJ 07070
Attention: Michael Sloan

(201) 939-9009 FAX: (201) 939-3391

Senior Product Engineer- Responsible for the introduction of new semiconductor products and advanced semiconductor fabrication processes into manufacturing. Achieve certain performance characteristics & yield goals for MOS fabrication processes as function of channel lengths. Properties of the actual fabrication process & the characteristics of the MOS transistors will have to be correlated with the simulated results obtained from advanced device simulation tools SPICE SUPREM & MINIMOS. Short channel characteristics & hot Electron Effects will have to be analysed. Testing of the Test Devices, yield modeling, evaluating effects of Laser blowing on fuses & recommending changes in the Integrated Circuits (IC) Fabrication Processes. Rigorous analyses will be performed to identify any problems & devising solutions to such problems, requiring programming & usage of VAX, Web & UNIX-based computations. Reliability testing & failure analysis for advanced semiconductor processes. Related to the Products, the responsibility consists of chip (IC) debug, yield enhancement & identification of chip problems & their solutions, circuit simulation by using SPICE, logic & circuit debug, characterization & testing of chips with automatic test equipment & bench setups. Recommending changes, when necessary in logic design, circuit design, test software & IC fabrication processes. Requirements are a Ph.D in Electrical Engineering, knowledge of tools: SPICE, SUPREM & MINIMOS, VAX, VMS, UNIX operating systems, MOS IC fabrication & analyses of semiconductor devices, background in semiconductor device technology, MOS short channel effects & hot electron effects, proven analytical background. Salary $48,559.80 per year. No sup. tea. 40hrs/wk. 8:15a.m.-5pm. If you are interested in, & qualified for the above position, please forward two (2) copies of your resume to: J.O.#1144, Commonwealth of Massachusetts, Dept. of Employment & training, Special Programs, First Floor, 19 Staniford St., Boston, MA 02114.

FACULTY FOR EUROPE AND ASIA

The University of Maryland seeks faculty to teach undergraduate computer science, computer applications, and information systems management courses on U.S. military bases in Europe and in Asia and the Pacific. Appointments begin August, 1991. Minimum requirements include a master's degree, recent college teaching experience, U.S. citizenship. Benefits include transportation and military base privileges (PX, commissary, etc.). Frequent travel and the cost of schooling make these positions difficult for those with children.

Send resume to Dr. Ralph E. Mills, Overseas Programs, The University of Maryland University College, College Park, MD 20742-1642. AA/EEO.

Senior Software Engineer-Responsible for performance of UNIX workstation user interface windowing software, & associated graphical tools, specifically X Window system servers & applications. Measure performance characteristics of such software release. Design, code, test & support performance test & measurement tools using programming languages C & C++. Analyze hardware usage & speed. Work with development engineers to improve software performance. Use queuing theory, performance modeling, simulation (in a simulation language such as SIMSCRIPT) & mathematical techniques to build & analyze models for performance evaluation of distributed computing applications & protocols, such as remote procedure call protocols. Analyse effects of communication protocols & network performance (of networks such as TCP/IP) on the performance of X servers. Develop project plans & product documentation. Requirements for this job are a Master of Science degree in Computer Science. Knowledge of distributed computing principles & protocols. Background in performance evaluation of distributed protocols including generic message protocols. Knowledge of UNIX internals, communication protocols & network performance of TCP/IP networks. Knowledge of workstations, windowing systems & their associated graphical tools, simulation & performance modeling techniques, queuing theory, C, SIMSCRIPT, hands-on analytical & math skills. No experience required. Salary $48,000.40 per year 40 hr/wk. 8:15am-5pm. If you are interested in, and qualified for the above position, please forward your resume to C. Harmon, J.O.#1BA, 130 Lytton Avenue, Palo Alto, CA 94301-1044.

PROGRAMMERS AND ANALYSTS
LET 1991 BE THE YEAR THAT YOU BEGIN ACHIEVING YOUR FULL POTENTIAL

CTG/Scientific Systems Services, the systems integration division of Computer Task Group, offers new and exciting employment opportunities due to increased customer requirements. Our primary focus is the development of automation systems designed to improve client profitability in Manufacturing, Pharmaceutical, Process and Material handling markets.

If you possess a background in:

- Real Time Operating Systems
- Plant Floor Software Applications
- Operating systems: OS/2, UNIX, AIX, UMS, MS/DOS
- Minimum 5 years Work Experience
- "C", FORTRAN, or ASSEMBLER Languages

For information on positions at our headquarters located in Melbourne, Florida, or customer sites in many cities across the U.S., send your resume and salary requirements to: CTG/Scientific Systems Services, P.O. Box 810, Melbourne, FL 32902 OR call our Computer System (no parity, 8 data bits, 1 stop bit) for complete details on our Company, Benefits, Style and other employment opportunities (407) 722-0123. An Equal Opportunity Employer.

CTG Computer Task Group
Scientific Systems Services

PROGRAMMERS

- High Tech Environments
- High Performance Business Systems
- Low Stress Locales

FLORIDA, ATLANTA CONNECTICUT AND AUSTRALIA

Be A Part Of An Employee Owned Company

Call 1-800-552-CMSI

SLM Computer Management Sciences, Inc.

8663 Baypine Rd., Jacksonville, FL 32256, Dept. CW C191

SAN FRANCISCO BAY AREA

There is no slow down in the Bay Area!. Our clients have openings with the following skills:

• CICS	Programmer/Analysts, Systems Programmers
• MAC	Programmers
• DB2	Programmer/Analysts, DBAs
• IDMS/ADSO	Programmers, Analysts
• AS-400	Programmer/Analysts
• C/UNIX	Programmers, Systems Administrators
• RDBMS	All levels of ORACLE, INGRES, INFORMIX, SYBASE

THE SEARCH FIRM, INC.
598 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105
(415) 777-3988 FAX 777-8632

PROGRAMMERS/SOFTWARE ENGINEERS

SOUTH & SOUTHEAST ASSIGNMENTS

MAPICS	COPICS	DMAS	CMAS	AS400
DICS	RPG II	RPG III	S/370	ASSEMBLER
VM-CMS	OS DOS	SNA	VTAM	MVS JCL
TSO	COBOL	BASIC	PL/I	S/36
S/38	"C"	S/1	DCS	S36/SSP & UTILITIES
PC AT	VSK/SPZ	VSE JCL	DL/1	S36 SCP & UTILITIES
IMS/DB	DB2	ATS	UNIX/AIX	MRP
SQR	SLR	SQL	VM	RS6000 IDMS

Call or Fax Resumes To

Academy Design & Technical Services

1303 North State Road 7
Margate FL 33063-7687
305/973-7800 • Fax 305/973-4890

3000 Langford Road Bldg 400
Norcross GA 30071
404/263-6022 • Fax 404-449-9291

System Software Engineer, Multimedia Division. By February 1, 1991 please send resume to: Employment Security Department, ES Division, Attn: Job # 2408B0-L, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Works with other engineers to design device drivers for computer hardware utilizing multitasking operating systems. Designs software to support multi-media functions and hardware virtualization and creates code to implement motion functions for personal computers. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months work experience in hardware analysis and debugging (including kernel testing and review of peripheral devices) involving multitasking operating system and in usage of signal communication architecture involving a multitasking operating system. 20 course hours in computer architecture. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary $28,000-$1,000 per annum, depending on experience. 40 hours per week, flex time. EOE

Sunbelt Opportunities

ADABAS/NAT Progrmr/a's	30-37K
TANDEM Progrmr/a's	30-40K
DB2/SQL Progrmr/a's	30-40K
ADABAS/SQR Progrmr/a's	30-37K
Gen4 Progrmr/a's	30-35K
Datacom Progrmr/a's	30-35K
Manufacturing Progrmr/a's	32-38K
Retail Progrmr/a's	29-34K
MSA or MAD Progrmr/a's	30-40K
DCS Progrmr/a's	30-38K
IMS/DBDC Progrmr/a's	28-38K
ASSEMBLER Progrmr/a's	28-35K
MVS/COBOL Progrmr/a's	28-35K
VAX/COBOL Progrmr/a's	32-38K
HP 3000-COBOL Progrmr/a's	28-35K
DB2 or IMS DBA's	40-48K
EDP Auditors	28-40K

North Carolina's largest employment agency, in business since 1975, 300 affiliates. Opportunities in the Southeast and nationwide.

Corporate Personnel Consultants
3366-300 Latrobe Drive, Box 221230
Charlotte, NC 28222 (704) 366-1600
Attn: Rick Young, C.P.C.

Sal Software, one of the fastest growing contract programming and consulting firms, has immediate openings for

- TECH SPECIALISTS
- SR SYS ANALYSTS WITH ORACLE RELATIONAL DBMS IN A MULTI USER ENVIRONMENT
- UNIX C, DVE, WINDOWS
- ORACLE VAX VMS PROGRESS & PLUS
- AS 400 RPG
- DB2 PL/1 OR PL
- SQL, DS
- IDMS

• HOUSTON • DALLAS
• WASHINGTON

Please call, fax or mail resume to:
Sal Software Consultants, Inc.
2330 Timber Shadows Ste 2021
Kingwood, Texas 77339
1-800-486-1868
(713) 359-1868
Fax (713) 358-0662

We represent various Fortune 100-500 Corporations having immediate DP/MIS needs in the following areas:

CICS Experts - IBM 3090 MVS/XA; 2 yrs & up, PIA's, SIA's, PL's ..... 30 - 50k
Sr. PA: AS400/S36, 3-5 yr., MAPICS, BPICS or PMI36 helpful ..... to 45k
Tech Support - AS400; OS Updates; PTF's, Security, LAN & WAN connectivity & Configuration ..... to 45k
Sys Prog - MVS 2-5 yrs. OS Install & Maintain, Tuning & capacity planning. MVS/JAA, CICS, JES2, SAL, SMP/E, VTAM and DASD ..... to 55k
PA (1-5) - IBM, HP, DEC, UNISYS, PC; Cobol, Dbol, basic, C, 4th GL. Relational DB & case tools 25-45k

MARBL has placed hundreds of professionals in 11+ years! You are ENTITLED the best opportunity for advancement. Discover the MARBL difference!

MARBL Consultants - DP/MIS Div.
11270 West Park Place, Suite 270
Milwaukee, Wisconsin 53224
(414) 982-9160

UNISYS PROGRAMMERS

COBOL/DMS1100 ...	to $45K
COBOL/DMSII ...	to $45K
MAPPER ...	to $44K
LINC II ...	to $50K
DBA's ...	to $50K
EXEC or MCP ...	to $55K
COMS Support ...	to $42K
TRAVELING PA's ...	to $48K

We specialize in the permanent placement of UNISYS Programmers throughout the US. Current positions are available in the West, SW, MW, SE, NE and East. Service is FREE to the candidates.

COMPUTER STAFFING
(800) 950-UNISYS

SALES AND RECRUITING CAREERS

Cutler / Williams is a regional Information Management Services Company with 22 yrs. of success in providing our customers with solutions to their business computing problems.

For those who are new to Sales & Recruiting (1+ yrs.): Cutler / Williams offers an outstanding training program. Those who apply for our Professional Sales / Recruiting Training Program must be open to relocation locations and willing to participate on a rapid to estate of initial training, followed by 14 weeks of follow-on training, while performing as a Salesperson or Recruiter.

Cutler / Williams also has opportunities for experienced Data Processing Sales Representatives, Recruiters, Programmers, Programmer / Analysts, and Systems Analysts.

Call Karen at 1-800-527-4807 (outside Texas) 214-960-7053 (in Texas) or send resume in confidence to Cutler / Williams Inc., Dept. CW, 4000 McEwen So. Suite 200 Dallas, TX 75244

An Equal Opportunity Employer

CUTLER/WILLIAMS

SENIOR ACP/TPF PROGRAMMER ANALYST required. Six or more positions open for Senior ACP/TPF programmer analysts responsible for the design and development of new ACP/TPF applications in a real time environment. Design of system functionality, coding, testing, and implementation. Assist programmers and other analysts in program applications, design, test and implementation of new software. Ensure that software and system standards are maintained according to the principles of an ACP/TPF environment. Design interfaces with other aspects of transportation industry. Provide system maintenance and maintain system integrity. Applicants required to have a bachelors degree or its equivalent in computers, math or engineering with at least four years ACP/TPF programming and assembler coding experience. Annual salary will be $42,000.00 per year for a 40 hour work week. Additional salary may be paid up to $46,000.00 if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5757577. This advertisement paid by an equal opportunity employment employer.

HAWAII

DBS (MSA) PAYROLL/PERSONNEL PROGRAMMER ANALYST

REQUIRES minimum 7 years experience in IBM OS/MVS CICS/VSAM environment. At least 2 years must be recent experience in DBS (MSA) PAYROLL/PERSONNEL applications.

We are the largest private acute care facility in the Pacific Basin. Enjoy outdoor activities year-round in our warm and temperate climate.

Relocation assistance and temporary housing offered. For more information contact Rebecca , Employment Specialist, (808) 547-4703 or send resume to:

THE QUEEN'S MEDICAL CENTER
Personnel Services Division
1301 Punchbowl Street
Honolulu, Hawaii 96813
An Equal Opportunity Employer

TANDEM
COBOL, PATHWAY,TAL, SCOBOL C, SQL,X.25
STRATUS
PL1,COBOL,C ON/2
Fulltime/Consulting Positions available in the US/ABROAD
VAX MUMPS ORACLE IBM

STRATEM COMPUTERS INC.
Call Irwin 800-562-JOBS
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y 10001

COMPUTER PROFESSIONALS

OUR EXCELLENT REPUTATION IN THE DATA PROCESSING INDUSTRY AND SOLID CLIENT BASE WILL OFFER YOU THE OPPORTUNITY FOR PROFESSIONAL GROWTH. WE HAVE IMMEDIATE NEEDS FOR PERMANENT EMPLOYMENT AS WELL AS CONTRACT OPPORTUNITIES WITH OUR CLIENTS, WHO ARE BASED IN SUNNY CALIFORNIA. RELOCATION ASSISTANCE WILL BE CONSIDERED. MEMBER OF NATIONAL SEARCH NETWORK!

PERMANENT

- DATA CNTR. DIR. - DEC/VAX
- DEVELOPM'T MGR. - AIRLINE (KENTUCKY)
- NETWORK MGR. - VTAM/NCP (SAN FRAN)
- DATA ANAL. - DB2, IEW
- SYST. ANAL. - IEF
- DBA-DB2
- PROJ. LEAD -S/36, AS/400
- PROJ. LEAD - IMS, HOGAN
- IMAGE PROCESSING, LAN, M/F
- DEC/VAX, SYST. OR APPS
- S/38, AS/400, RPG III
- PASCAL, BASIC, IBM PC
- DB2, CSP, TELON
- 4TH GL, DBMS, PC'S
- PROP. & CAS. BKGD., COBOL, CICS

CONTRACT

- IEW WORKBENCH, EIS
- DB2, CSP
- IEF

IF YOU HAVE EXPERTISE IN ANY OF THE ABOVE AREAS OR SIMPLY WISH FOR US TO FIND THAT RIGHT OPPORTUNITY FOR YOU, PLEASE CALL OR SEND RESUME TO:

D.P. SPECIALISTS, INC.
DEPT. CW
2041 ROSECRANS AVE., STE #106
EL SEGUNDO, CA 90245
PHONE 213/416-9846
FAX 213/416-9003

DPS
D.P. Specialists, Inc.

CALL US...
Because Your Future Is Our Business

M.I.S. International is one of Michigan's oldest and most respected consulting firms. For over 20 years, we have provided top-notch data processing services to Fortune 500 firms including the major automobile manufacturers and suppliers.

We are enjoying exceptional growth in our Michigan, Ohio and California offices, making this a perfect time to step up to a permanent position on our technical staff. Currently available opportunities include:

- C with ORACLE and UNIX
- C, UNIX, X-WINDOWS (X-LIB & X-INTRINSICS), MOTIF a+
- DB2 COBOL with IMS or CICS
- IMS DB/DC COBOL
- AS/400 SYNON
- PROJECT MANAGERS with Banking Bkgd. and ABT's PROJECT WORKBENCH
- BUSINESS ANALYSTS with Banking Bkgd.
- FOCUS
- HP 3000 TRANSACT or COBOL
- DEC VAX with PL/1, COBOL or FORTRAN

Call Marie Clark at 1-800-878-1119, or forward your resume to: MIS International Corporate Headquarters, 445 Enterprise Ct., Bloomfield Hills, MI 48302. FAX (313) 253-8506. Equal Opportunity Employer.

MIS
INTERNATIONAL INC

$45,000 to $60,000
PROGRAMMER/ANALYSTS
DB2-IMS-MODEL 204

Recent acquisitions have resulted in the immediate need for experienced Systems Analysts and Programmers for Louisville, KY, Cincinnati, OH, and the Indianapolis, IN areas.

Experience in large IBM environments utilizing Database and/or Data Communication products is preferred. We are developing large database applications and seek individuals with a sincere desire to utilize current skills and realize their growth potential.

For consideration, send resume or call:

TCI
2020 Meidinger Tower, Louisville, KY 40202
(502) 589-3110 FAX (502) 589-3107

An Environment Of Achievement.

USAA

At USAA, our people-first orientation and aggressive pursuit of advanced technology have built a 68-year tradition of achievement. Today our team spirit, open communication and intensive "Total Quality Management" approach are creating an even stronger achievement environment for the next century.

A Community For Families.

In San Antonio, Texas, you'll discover a rich multi-cultural lifestyle that combines urban amenities, easy commuting and one of the lowest living costs in the nation. It's a great place to raise a family, and we ought to know: USAA's corporate family is one of the biggest and best in San Antonio.

We are currently seeking:

DB2 PROFESSIONALS

PROGRAMMERS with DB2 skills in a maintenance or development environment. Previous exposure to IMS desirable. Minimum of 1-2 years experience with IBM mainframe applications.

DATA BASE ADMINISTRATOR with experience in the physical implementation of a data model. Requires use of tools: DB2, Explain, Lode. Minimum of 5 years experience with IBM mainfame applications and/or systems experience.

SYSTEMS PERFORMANCE

SYSTEMS PROGRAMMER with experience required in planning large system configurations, leading systems projects and MVS/ESA performance tuning. Strong system problem determination and resolution experience necessary. Understanding of concepts involved in developing and maintaining a high performance shared DASD and tape environment is also required.

Other requirements:

- 2 years' experience with MVS/ESA or MVS/XA system performance in a multi-CPU, shared DASD system environment.
- Knowledge of the following: OMEGAMON, RMF, CA-FASTDASD, MICS, TSOMON, PAS.

IMS SYSTEMS PROGRAMMER

- Requires 5-8 years IMS Systems Programming experience
- IMS Maintenance using SMPE
- Knowledge of MVS/ESA Concepts, IMS Recovery/Restart and DBRC
- IMS Dump Debugging skills and use of the IBM Support Center
- ALC
- Knowledge of and experience with the following is a plus:

IMS Performance Tuning	VTAM & Communication Networks
Boole & Babbage's IMF	BMC's 3270 Optimizer
DB/DC Monitor	IMS ASAP
IMS FASTPATH	BTS
IPCS	IMS online application design & development

Qualified applicants should send a resume to:

USAA
USAA Building
San Antonio, Texas 78288-0055
Attn: Employment & Placement/TLL/SD/CW
FAX: (512)498-1489

No agencies, please. An Equal Opportunity Employer. M/F/H/V.

UNIX SYSTEM MANAGER

at The Institute of Systems Science (ISS), Singapore

The primary domain of System Manager is advanced UNIX workstations. The incumbent will train and supervise system support staff in addition to doing network configuration, installation of security procedures and regular backups, procurement and vendor liaison, installation of hardware and software, technical support to research staff, long term planning and design strategies for system facilities and resources.

Required: a) Bachelor's degree in Electrical Engineering or Computer Science from a reputable university, b) 4 years' experience in managing UNIX machines, c) vendor development experience and experience in managing people.

If you are ready to take up this opportunity, please send your resume to the Director of Personnel, National University of Singapore, 10 Kent Ridge Crescent, Singapore 0511 or fax ISS Recruitment Manager (UNIX Systems) at (65)-775-0938 or Telnet ISSAPPLY @ NUSVM.

ISS

CIBER HAS OPPORTUNITIES NATIONWIDE!

CIBER is one of the largest privately-owned professional services firms. Because of our reputation, CIBER has openings throughout the U.S. We continue to expand our operations and are growing *over 30%/year. More opportunities, superior benefits,* and a great place to work are drawing the best skilled consultants to CIBER. Among today's requirements:

TELON, DB2, IDMS, ADS/O, CAS, ADABAS
NATURAL, C, UNIX, COBOL, IMS, TCP/IP, SQL

These are just a few of CIBER's current needs. Relocation assistance is available. Please call or fax or mail your resume ASAP to our headquarters or contact any of 14 offices.

CIBER, Inc.®
1200 Seventeenth Street, Suite 2700
Denver, CO 80202
(800) 669-0401
Fax: (303) 572-6405

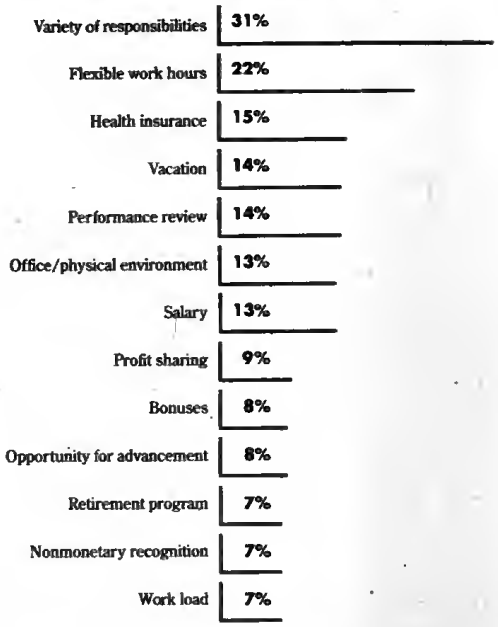
INDUSTRY CURRENTS

MANUFACTURING

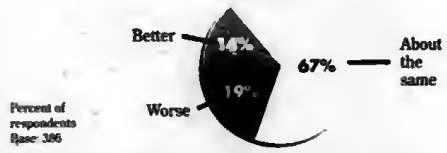
Mean salaries of IS personnel

CIO/VP/Director of IS Base: 225	$69,140
Manager, end-user computing Base: 44	$49,041
Network manager Base: 36	$47,111
Systems & programming manager Base: 140	$52,989
Systems analyst Base: 83	$38,277
Programmer Base: 118	$27,976
Technical services manager Base: 81	$54,689
Database manager/Administrator Base: 52	$46,904

What aspects of your current position are you very satisfied with?



How do you think your department's salaries compare with those of other organizations in your region?



Source: Computerworld salary survey

CONTRACTORS

MONEY MATTERS.

SOFTWARE — DP CONSULTANTS
URGENT NATIONWIDE OPPORTUNITIES

- **TECH WRITERS:** UNIX, MVS, VM, INSTALLATION MANUALS.
- **OPERATING SYSTEM DEVELOPERS:** UNIX, OS/2, MSDOS, VMS
- **DATA BASE DESIGNERS:** ORACLE, RDB, SYBASE, SQL
- **USER INTERFACE:** X-Windows, Windows 3.0 Pres. Mgr
- **PROG/ANALYST:** Multi long-term needs in various locations. VAX, COBOL, RDB.
- **IBM M.F. AND AS/400 CONTRACTORS:** Stay busy in 1991. Call today.
- **SW ENGINEERS:** VAX DTM or VAX ADA...Urgent Need!
- **NEW PRODUCT DEVELOPMENT!!!** Engineers Needed to develop a new graphics product. **DEC 3100, VAX ELN or REAL TIME, X, MOTIF.**
- **6-10 LONG TERM ASSIGNMENTS:** Design, code, and test. S/W for the Communications Industry. Development will be in a **VMS, ADA, GRAPHICS** (PHIGS, DEC WINDOWS) environment.

CONTRACT Solutions Inc.
J.F.K. Box 8886
Boston, MA 02114

IN MA 800-227-8152
NH 603-883-6776
FAX 603-883-4208
Two Keewaydin Drive
Salem, NH 03079

Lead System Software Engineer Multimedia Group. By 2/1/91 please send resume to: Employment Security Department, ES Division, Att: Job # 240848-T, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Assumes lead responsibility over other engineers to design operating system extension for multimedia software utilizing MS-DOS, Windows and OS/2 operating systems, "C" and 86 Assembler Series family of languages, and Intel 286 and 386-based computers. Designs device drivers as dynamic link libraries for multimedia Windows systems using direct memory access techniques. Works with Independent Software Vendors (ISVs) to coordinate development of new applications in multimedia environment. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Physics or Mathematics. Two years of work experience in design of device drivers and in using direct memory access techniques. This must include 6 months of work experience utilizing MS-DOS, Windowing, and OS/2 or multitasking operating systems, "C" and 86 Assembler Series family of languages, and Intel 286- or 386-based computers. Must have legal authority to work permanently in the United States. Job location: Redmond, Washington. Salary: $44,850-48,000 per annum, depending on experience. 40 hours per week, flex time. EOE

DELUXE DATA SYSTEMS, INC.

ON-LINE SYSTEMS DEVELOPMENT AND SUPPORT OPPORTUNITIES

We are looking for a few select individuals who have experience in on-line systems development and support utilizing TANDEM technology. The opportunities are the result of continued growth in our Electronic Funds Transfer (EFT), Card Management, Retail Payment Automation, and Electronic Benefits Transfer (EBT) businesses.

Successful candidates must possess:

- Pathway
- SQL
- On-Line systems exposure
- TAL and COBOL languages
- 2+ years of TANDEM experience

Deluxe Data Systems, Inc. is located in a suburb of Milwaukee, Wisconsin and is the leader in third party transaction processing, and high performance transaction processing software. Our CONNEX and CONNEX ASSET products are distributed worldwide.

We offer full benefits and an outstanding compensation and relocation package. For those interested in furthering their software career, there is no better place than Deluxe Data Systems. Interested candidates should respond with resume and cover letter stating salary requirements to:

Corporate Recruiter
DELUXE DATA SYSTEMS, INC.
8901 N. Kildeer Court
Brown Deer, WI 53209

RSVP SERVICES

ANALYSTS • PROGRAMMERS • HW/SW

In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will be on its way selectively, to our applicable contacts among our 1000+ client companies and 200+ affiliates nationwide **within 24 hours after we receive it.** No cost or obligation to you, no sales pressure.

Our clients seek 2 years minimum professional experience, stable work history, good technical references, and U.S. citizenship or green card.

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Dept. C, Suite 814, One Cherry Hill Mall, Cherry Hill, NJ 08002
800-222-0153 or FAX 609-667-2605 (refer to Dept. C)

UNIX/C PROGRAMMERS

▲ DESIGN
▲ DEVELOP
▲ LEARN RDBMS

With Our Entrepreneurial Employee Owned Company

Call **1-800-552-CMSI**

Computer Management Sciences, Inc.

8993 Bayard Rd., Jacksonville, FL 32256, Dept. CW B191

YOUR FUTURE IS OUR BUSINESS

Permanent National Opportunities

Cantonese with technical translation ability in computer terminology for communication with local organizations & customers & sales background in the Far East is required. Salary: $41,000 per year. 40hr/week, 8:15 a.m. to 5:00 p.m. If you are interested in and qualified for the above position, please forward two (2) copies of your resume to: P.O. #1005, Commonwealth of Massachusetts, Department of Employment & Training, Special Programs, First Floor, 19 Stanford Street, Boston, MA 02114.

SOFTWARE PROFESSIONALS

Computerworld has dedicated the pages of this special section to predicting the outlook for computer careers in the coming year

With over 200 scientific and business software professionals, Computer People Unlimited is Wisconsin's largest, locally owned professional software services firm. We are predicting continued growth and solid computer career opportunities in our coming year, and beyond

Success has enabled us to work with many of the top companies in the Wisconsin business community — major banks, insurance companies, utilities, manufacturers and retailers. Due to this diverse range of clientele, we are able to match our employees' personal abilities with our clients' needs.

Are assignments which offer technical challenge, career development and variety in your future? We currently have opportunities for professionals with any combination of the following experience.

- DEC VAX
- IDMS - ADS/O
- TELON
- UNIX
- C
- C++
- Sun

WE'RE LOOKING FORWARD TO THE FUTURE

Additional opportunities are available for professionals with any combination of the following: **LANSA, PL/1, PC Applications, AS/400 or System 38, FOCUS Programming, Tandem, Pathway, TAL, SCOBOL, DB2, ORACLE, IMS, LAN Administration.** Scientific software opportunities also exist for professionals with experience in any combination of the following: **Objective C, Smalltalk, Real-time, VAX/VMS and X-Windows.**

Put success in your future today. Contact Bill Rudd or Julie Endlich at 414-225-4000 or 1-800-527-8462. Or send your resume, in confidence to: Computer People Unlimited, Dept. CW-0107, 744 N. 4th Street, Milwaukee, WI 53203. An equal opportunity employer. No entry level positions available

CPU
COMPUTER PEOPLE UNLIMITED INC.

Analysts International Corporation "1991 Opportunities"

Allow Analysts International Corporation to help you realize your potential...both financially and professionally. We are a leader in the field of Software Consulting Services with 26 offices nationwide. These services, which involve both software and hardware, include consulting, project management, systems analysis and design, programming, training and hardware/software evaluations.

Our primary resource is people. AIC is committed to attracting and developing the highly talented professionals who are dedicated to excellence, integrity and innovation.

We offer competitive salaries, complete benefits which include medical, dental and life insurance as well as 401K and relocation assistance. If you have two or more years of any of the following, AIC is anxious to talk to you:

IBM
Batch Cobol
Cobol/CICS/IMS
DB2/CSP
Sys 38
Synon
AS400
Case Tools
Communications
Cobol II

IBM
C/OS/2-PM
Unix/Ultrix/Aix
Riac 6000
OS/2 Kernels
Informix
RPG III or 400
J.D. Edwards
Model 204
Netview

IBM
Rexx
ADF
APL
Nomad
Telon
IDMS/ADSO
Series 1 Assembler
Easytrieve
Pacbase

DEC/VAX
Cobol or C or Fortran
Oracle
Ingress
ACMS
Rdb
TDMS
Decnet
Datatrieve
FMS

TANDEM
Cobol/Scobol
Nonstop SQL
Tal
Pathway

HP
Cobol/Fortran
Image
View
Cognos
Powerhouse

UNISYS
1100 Cobol
Mapper 3dR

PACKAGES
MSA
Mapics
Copics
McCormack & Dodge
Hogan

Please contact our Corporate Recruiters at any of the offices listed for these and other exciting opportunities with AIC. We are an EOE/Affirmative Action Employer

ATLANTA
Perimeter 400 Center
1100 Johnson Ferry Rd. NE
Atlanta, GA 30342-1707
404-256-5190

AUSTIN
11044 Research Blvd.
Suite 8210
Austin, TX 78759
512-794-8194

BOCA RATON
621 NW 53rd St.
Suite 350
Boca Raton, FL 33487
407-241-5912

DALLAS
3030 LBJ Freeway LB 52
Suite 820
Dallas, TX 75234
214-243-2001

HOUSTON
2010 North Loop W
Suite 103
Houston, TX 77018
713-682-3996

KANSAS CITY
Manor Square
4050 Pennsylvania
Suite 324
Kansas City, MO 64111
816-531-5050

LEXINGTON
333 W Vine St.
Suite 300
Lexington, KY 40507
606-233-4506

AIC.

MINNEAPOLIS
7615 Metro Blvd
Minneapolis, MN 55439
612-835-2330

RALEIGH/DURHAM
1000 Park Forty Plaza
Suite 330
Durham, NC 27713
919-544-5205
800-669-9125

ST LOUIS
MW Region/Branch Off.
600 Emerson Road
Suite 200
St. Louis, MO 63141
314-997-1746

TAMPA
5401 W. Kennedy Blvd.
Suite 480
Tampa, FL 33609
813-281-0456

Data Processing

INFORMATION SYSTEMS

The LOCKHEED AERONAUTICAL SYSTEMS COMPANY currently seeks INFORMATION SYSTEMS SPECIALISTS for the following positions:

- **INFORMATION SYSTEMS TECHNOLOGY**
Positions require either IBM or DEC experience with strong analysis/programming skills. Knowledge of IEW workstation is required. Additional understanding of VM, MVS, VMS, VTAM, TCP/IP and/or DB2, SQL/DS, Ingres and WINDOWS.

- **DATABASE MANAGEMENT ADMINISTRATION**
Provide overall support for IBM Database functions to include IMS DL/I, DB2, APS for the IMS environment.

- **MANAGEMENT SYSTEMS SUPPORT - VM**
Provide VM-based user support to include the creation of prototype database applications and test and installation of new Nomad releases and other 4GL's. Ramis experience is desirable.

- **MANAGEMENT SYSTEMS SUPPORT - PC**
Provide PC technical support to include preparing and troubleshooting advanced PC configurations; design and support IBM Token-Ring and Ethernet lans running PC Lan, Microsoft Lan Manager, and OS/2 Lan Server or Novell software.

- **PROGRAMMING**
Develop and maintain computer applications on IBM 3090, MVS/XA, UNISYS 1100 using DMS - 1100/TIP or DEC/VAX using VMS/Basic-Plus. Strong COBOL required, Fortran a plus.

- **EQUIPMENT EVALUATION**
Review and evaluate computing and peripheral equipment to include recommending acquisitions and negotiate lease/purchase.

- **SYSTEMS SOFTWARE**
Install and maintain database/data communications products in the MVS operating system environment, particularly IMS, CICS and DB2.

- **TELECOMMUNICATIONS SUPPORT**
Investigate and recommend technologies and equipment for cost effective systems to support state of the art voice communications.

- **UNISYS SYSTEMS PROGRAMMER**
Suppport of UNISYS 1100/9X operating systems. Must be able to generate system, apply maintenance and perform problem determination and resolution. Proficiency in PLUS, MASM and COBOL is required. Experience with TIP, IR, DMS, MCB and IPF is desired. UDS is a plus. Hardware environment is 1100/92, 8481, DCP40

- **PAYROLL/PERSONNEL PROGRAMMERS**
Programming experience on IBM 3090 using COBOL, IMS DB/DC or DB2. Experience with TESSERACT payroll/personnel system software package, a plus. Working experience with NOMAD is also a plus.

- **PROJECT MANAGEMENT SYSTEMS PROGRAMMER**
Experience on MVS/TSO with additional experience programming Mainframe Artemis. A heavy emphasis on graphics and plotting makes experience with GDDM and Versatec Plotters highly desirable. Knowledge of IBM's AS and DB2 would be a definite plus

All positions require individuals with a Bachelor's degree along with 2-7 years of related experience.

The above positions are career opportunities for individuals seeking a challenging professional environment. LOCKHEED AERONAUTICAL SYSTEMS COMPANY is located in Marietta, Georgia, an attractive suburb of Atlanta, and offers excellent salaries and a comprehensive benefit program. Please forward resume for immediate consideration to: **LOCKHEED AERONAUTICAL SYSTEMS COMPANY 86 South Cobb Drive, Department 90-31, Zone 0530, Marietta, Georgia 30063-0530.** An Equal Opportunity/Affirmative Action Employer

Lockheed
Aeronautical Systems Company
INNOVATION: giving shape to imagination

"NEW YEAR - NEW CAREER"
"A START UP SOFTWARE VENDOR"

VTAM * NETVIEW * VM * MVS * IMS

* INTERNALS DEVELOPERS & PRODUCT AUTHORS *
* PRE AND POST SALES SYSTEMS ENGINEERS *
* DIR-VP OF DEVELOPMENT & DIR MARKETING *
WE WILL REWARD YOU WITH:
45-150K * ROYALTIES * STOCK * 401K * BONUS
RELAXED ENVIRONMENT AND ATTIRE
FULL RELOCATION TO SO. & NO. CALIFORNIA

Then a right we offer ROYALTIES!!! We feel if we want the most CREATIVE DEVELOPERS we must reward that creativity. We are currently planning to undertake a major project to develop an Automated Network Product Line. We are a privately owned company seeking all the experts listed above. LET US MAKE YOUR NEW YEAR THE BEST YEAR EVER.

DB2, VTAM, CICS, OR VM INTERNALS, RE-ENTRANT BAL, VTAM APPS @ 3270 LINE CODE
AUTOMATED DEVELOPMENT TOOLS, NETWORKING, EXPERT SYSTEMS, ARTIFICIAL INTELLIGENCE

CALL WAYNE CARTER TODAY
213-278-6339 FAX 656-1599
9100 WILSHIRE BLVD #442BEVERLY HILLS, CA 90212

International Opportunities in Information Services Management

The following executives are needed by a U.S. owned computer service company, operating in South America. This company's services include: systems development, bureau operations, hardware maintenance and general consulting. Current staffing is 60-70.

General Manager

Candidates must be self motivated, with drive and initiative, have excellent administrative and business development skills. They should also have a good knowledge of information technology and be bilingual in English and Spanish.
Experience overseas with U.S. based multi-national companies will be an advantage

Manager - Systems Development

Candidates must have experience of modern systems development techniques and be able to introduce these in existing development teams. They must also have demonstrable experience in managing development projects.

Send resume to **Administrative Recruiting Services, 2432 W. Peoria, Suite 1264A, Phoenix, AZ 85029**

We're The Registry a dynamic, rapidly growing Software Consulting Company with unique and highly challenging assignments for both Software Engineers and MIS programmers at all levels of experience. Our expanding list of clients (many of which are in The Fortune 500) offer the opportunity for critical involvement in some of the most demanding and exciting environments within the greater Boston area and throughout the United States.

NATIONAL

- IMAGING
- VMS/DTM
- CICS/TELON/DB2
- ADABAS/NATURAL/BUILDER
- UNIX/INFORMIX 4GL
- OS2/LAN/DATABASE
- TANDEM/SQL/ENSCRIBE
- VM/MACIM/BBC FORMS

Contact: Sharon
1-800-248-9119

BOSTON

- AIX 370
- UNIX/OA
- SYBASE/DBV
- UNIX/TOOLS
- INFORMIX 4GL
- MAC/DEV/TOOLBOX
- X-WINDOWS/MOTIF
- IBM/CBA PACKAGE EX.

Contact: Dave
(617) 237-9119

Fax: 617-237-0723

42 Washington Street, Wellesley, MA 02181

An Affirmative Action/Equal Opportunity Employer — Member NAGCB

The Registry

MAKE A CAREER RESOLUTION TO JOIN SPC IN '91!

Systems & Programming Consultants has spent 10 years servicing prestigious customers throughout the Southeastern United States with an unwavering commitment to quality of service. From banking to manufacturing to insurance to financial corporations, SPC is sought out as a major contract and consulting firm.

SPC has professional opportunities for **PROGRAMMER/ANALYSTS** with a minimum of 2 years experience in COBOL and any of the following areas:

• IMS DB/DC • CICS • DB/2 • HOGAN • IDMS • ORACLE, C
• OS/2, KNOWLEDGEWARE, EASEL • AS400 • DB/2-CSP

These opportunities are available at any of our Southeast offices:
ATLANTA • CHARLOTTE • NASHVILLE • ORLANDO • TAMPA

Please call or send your resume, stating your desired geographic location, to:

SPC
Systems & Programming Consultants
ATTN: PERSONNEL
212 S. Tryon St./Ste. 1360
Charlotte, NC 28281
1-800-277-SPC1

IBM Business Partner

- New Development Positions
- Diverse and Challenging Work
- Quality Lifestyle You Can Afford to Enjoy!

Idaho Department of Health and Welfare has openings for programmers/analysts with the following skills:

ADABAS/Natural 2, COBOL/CICS/VSAM in an MVALOS environment, and MUMPS. Opportunities for new development projects and system modifications in areas such as **Accounting, Medicaid, Substance Abuse, Social Services, Aids to Families With Dependent Children and other Health and Welfare programs.**

Enjoy a 4 season climate that averages 214 days of sun. Idaho's low cost of living offers a quality lifestyle as well as cultural ammenities and recreational opportunities you don't want to miss.

Idaho ... America's Best Kept Secret.

for further information
Contact Larry Tippets, 208-334-5633
EOE M/F HC/VET

Software Engineer II - Responsible for the design, development & use of various software tools to maximize aspects of the UNIX-based operating system on RISC (MIPS-based) architecture. Evaluate overall system level performance & subsystem (disk, network, etc.) performance. Overall system performance evaluation would include design & use of computer application based multi-user workloads, internally designed & industrial standard benchmarks. Subsystem performance would include design & use of C based tools of the applications & kernel level. Analyze collected data using statistical analysis, performance data for simulation & systems modeling & capacity planning. Work with system developers to identify & resolve performance problems & their implications, act as a team member of a computer performance group. Requirements for this position are: a Master of Science in Computer Science; a demonstrated ability in UNIX-based operating systems; knowledge of C or the applications & kernel areas; performance evaluation, computer application based multi-user workloads, workload characterization, benchmarks, capacity planning & simulation, performance modeling, RISC (MIPS based) architecture & statistical analysis. Salary $40,560.80 per year. No pay, no 40 hours, 8:15am-5pm. If you are interested in, and qualified for the above position, please forward your resume to: New Hampshire Department of Employment Security, Job order #91-16 Employment Service Bureau, 32 South Main Street, Concord, NH 03301-4857.

DATA COMMUNICATIONS POSITIONS

West Virginia University, the state's land-grant research university has more than 20,000 students enrolled in 175 degree programs and is located in Morgantown, WV, a community with a population of 60,000 in a greater urban region with easy access to Pittsburgh, PA and Washington, DC. We seek three experienced data communications specialists with strong proficiency and knowledge of data communications services such as FDDI, T-3, Switched S6, Frame Relay, ISDN, BRI, and PRI services, LAN technology including Token Ring, Ethernet, DECNET, and Localtalk. Applicants should also possess a comprehensive awareness of communications protocols and standards including X.25, TCP/IP, LAPS and LARD, as well as excellent communication and writing skills.

MANAGER/CAMPUS NETWORK SERVICES

Leadership to plan, design and implement the data communications connectivity for the University departments as part of an integrated campus wide network environment. MS degree in Computer Science, Engineering, or related field plus five years work experience in the data communications field with particular experience in the design and implementation of large fiber backbone network, or an equivalent combination of education and experience required.

DATA COMMUNICATIONS ANALYST

Assist in data communications connectivity for an integrated campus wide network environment. BS degree in related field plus three to five years experience in the data communications field, or an equivalent combination of education and experience required.

Send letter of application, with salary history, resume, transcripts and names of three references to:

West Virginia University
Department of Human Resources
Knapp Hall
Morgantown, WV 26506
Attn: Box AA

West Virginia University is an equal opportunity affirmative action employer

Start The New Year S.M.A.R.T.

A Career Move To Anatec Is Your Best Resolution

As we enter our second decade of growth, Anatec invites entrepreneurial-minded information processing professionals to start the New Year SMART. Synergism of Management, Analytical Resources and Technology is a solution-oriented philosophy that starts with Anatec's top management.

SMART fosters creative solutions to client problems. Some solutions, in fact, are so unique they're patented.

Join our talented team as a Systems Analyst, Programmer/Analyst or Project Leader in local, national and international positions. Immediate opportunities are available in the following areas:

- INGRES
- SYBASE
- ORACLE
- FOCUS
- IDMS
- EDI
- OS/2
- DB2
- IMS DB/DC
- SQL/DS
- CICS
- MS-WINDOWS
- CATIA
- HP 3000

Anatec provides opportunities to learn new skills and use the latest technologies like Relational Databases, plus earn an outstanding salary and benefits package commensurate with experience. For immediate consideration, please call us at 313/540-4440 or send resume to:

ANATEC
Analytical Technologies, Inc.
Personnel Director - CW1/3
30999 Telegraph Rd.,
Suite 120
Birmingham, MI 48010
Fax: 313/540-4343

Equal Opportunity Employer M/F/H/V

PURDUE UNIVERSITY
Department of Computer Technology
(Computer Information Systems)

ANNOUNCEMENT: Purdue's Department of Computer Technology invites applications for tenure-track positions at West Lafayette and its outreach sites. **PROGRAM:** Computer Technology is an award-winning, nationally prominent undergraduate program in information systems and applications development. The department's primary mission is undergraduate education scholarship, and service, not research. **POSITION:** Positions at the rank of Assistant or Associate Professor (tenure track). **DUTIES:** Developing and teaching courses in software development (inclusive of programming), information systems, microcomputer applications, database, systems analysis and design, data communications, expert systems, computer integrated manufacturing, and decision support systems. Two positions are targeted specifically for course development in (1) database and (2) telecommunications. The other positions are targeted for general IS courses (programming, applications and systems development). Faculty are also expected to participate in industrial relations and recruiting, take an active role in department, school, and university committees, and regularly contribute to scholarly activity in the form of presentations, publications, professional association, and creative works. **QUALIFICATIONS:** MBA, MS, EdD or PhD in Computer Science, MIS, DSS, or other computer-related field is desired; at least 3 years of industrial experience preferred. Prior teaching experience considered beneficial. All applicants should be conversant in COBOL or BASIC. **SALARY:** Open. **STARTING DATE:** August 1991. **APPLICATION:** Send detailed resume to: Professor Jeffrey L. Whitten, CDP, Department Head, Department of Computer Technology, Purdue University, KNOY-242, West Lafayette, IN 47907. Phone: 317-494-4345. Applications will be accepted until all positions are filled. Purdue University is an EO/AAE.

Immediate Permanent/Consulting

TANDEM
East Coast/Mid-West/West Coast

Junior & Senior P/A's, PE/CE, System & Project Managers
Banking, Brokerage, Telecommunications, Oil/Gas & others

PATHWAY, SCOBOL, COBOL, C, TAL, Non-Stop SQL, SNAX, BASE-24, GUTP, QA

Mail or Fax resume to Steve at:

TALON
Professionals, Inc.
11987 Sunset Ct., Ste. C12
Reston, VA 22091-3224
(703) 264-9052

Serving Only TANDEM Users & Professionals Across the U.S.

Our database has 7,500+ openings nationwide for MIS professionals! All hardware platforms - all skill levels & job titles. Salaries depend on location, responsibilities and experience.

FAX or MAIL resume with salary & geographic preferences to:

SSC, Inc.
101 S. Main Street
Suite 200
Bel Air, MD 21014
FAX (301) 838-0888

Employer Pays Fee

One thing every executive should have after retirement:

An adventure.

Gold watches are fine for some retired executives. But after a lifetime of experience, moving from the trenches to the front offices, your knowledge is worth more—to us and to hundreds throughout the world in need of your special skills.

Through the International Executive Service Corps—the not-for-profit organization that sends U.S. managers to help businesses in developing nations—you can volunteer for short-term assignments in foreign countries where you're truly needed. Although you will not be paid, you and your spouse will receive all expenses, plus the personal satisfaction of teaching others while you discover more about yourself.

It's an adventure of the spirit. And the time to explore it is now. So please, don't let this golden opportunity pass by. Send for more information today.

International Executive Service Corps

Ad Council

Turn your lifetime of experience into the experience of a lifetime.

YES, I'd like to share my lifetime of experience with others. I recently retired from my position as a hands-on manager with a U.S. company. I also understand that volunteers and their spouses receive expenses, but no salary. Please send me more information now.

Name _____

Address _____

City _____ State _____ Zip _____

In what publication did you see this ad? _____

Write to: IESC, 8 Stamford Forum, P.O. Box 10005 Stamford, CT 06904-2005. Or, for faster response, call this number: (203) 967-6000. BP

CASE IEW/IEF

EAST COAST/ WEST COAST - SOUTHWEST

CHC is a national full service data processing and consulting organization, with 27 offices throughout the U.S. We are a comprehensive source of expert technical knowledge and skills creating solutions to the most complex information management and business application problems.

Our CASE and ICASE teams on both Coasts are engaged in significant development efforts for a variety of clients including Service, Manufacturing, and Financial "GIANTS" within their industries.

If you possess ICASE or CASE experience and seek either long term employment or short term assignments utilizing your skills, we should talk.

CHC provides full benefits including company paid relocation. Temporary housing available for short term assignments.

®COMPUTER HORIZONS CORP.

EAST COAST
Ed. Fuccello
40 Old Bloomfield Avenue
Mountain Lakes, NJ 07046-1495
In New Jersey call (201) 402-7400
Outside of N.J. call toll free
1-800-321-2421 or Fax (201) 402-7986

WEST COAST
Richard Rauchbach
225 West Broadway
Suite 475
Glendale, CA 91204
Call Collect (818) 502-1263
or Fax (818) 502-1879

SOUTHWEST
Kathy Malloy
3200 East Camelback Road, Suite 369
Phoenix, Arizona 85018
Call Collect (602) 956-7055
or Fax (602) 956-7969

An Equal Opportunity Employer M/F
"The Solution Experts"

ENJOY THE BEST OF BOTH WORLDS

WORK WITH AS/400 USERS AND WORK WITH THE AS/400 EXPERTS.

Keane, Inc., a $95M applications software development company with offices throughout the East Coast and Mid-West, is currently seeking professionals to work with us in Rochester, MN, birthplace of the AS/400. Recognized in 1990 as one of the top "100 Best Small Companies in America" by both Forbes Magazine and Business Week, Keane, Inc. is continuing its success, and would like to extend a personal invitation to you to join us.

These are full-time positions and include: a competitive salary; generous relocation assistance; superb benefits and savings plans; tuition reimbursement; use of vacation condos and more.

These positions require:

- A minimum of two years programming (any language) on either System/3X or AS/400 platforms with a broad range of knowledge at the applications level, including CL and Utilities.
- The ability and desire to assist AS/400 users in resolving any questions or difficulties they might have.
- Excellent written and oral communication skills and strong professional characteristics.
- The will to succeed. The desire to learn and work with AS/400 users, experts and technologies. A strong commitment to achieving both personal and professional goals.

If you are satisfied with your current position, we would like to wish you the best in all your present and future endeavors. However, if the thought of working side by side with true AS/400 experts for one of the most respected small companies in America is of interest,

Please contact Eric Schultz, Manager of Human Resources, at 1-800-876-1552 or send your resume to his attention at Keane, Inc., 1605 North Broadway, Rochester, MN 55906. An equal opportunity employer.

KEANE

Work In An Energy Driven Environment.

CAROLINA POWER & LIGHT COMPANY is a major force in Southeastern power generation and distribution. We offer information systems professionals a fast moving environment with the latest in proven technology.

Along with wide use of personal computers, we're operating one IBM 3090-300, one IBM 3090-200, and one Amdahl 5890-300. The CICS on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE tools.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are currently seeking the following:

APPLICATIONS DEVELOPMENT

PROGRAMMERS

Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

SYSTEMS ANALYSTS

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/1 knowledge. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

LAN SUPPORT ANALYST

Requires 3-5 years of technical experience in personal computer support, including a minimum of 1-2 years in the design, implementation and support of Local Area Networks, preferably in a LAN-to-LAN or wide area connectivity environment. Banyan network operating system experience strongly desired. Candidates must possess strong verbal and written communication and client consulting skills. A four-year degree is preferred.

There are few areas in the country as attractive as the Carolinas. The landscape is famous for its rolling hills and magnificent fall colors. The capital city of Raleigh, location of our headquarters, is known for its nationally recognized university programs, sports and proximity to both beach and mountain resorts. Despite its growth, the region has maintained a moderate cost-of-living and its southern charm.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of an important team of professionals, send resume with salary requirements to: **Mary Anne Lynch, Senior Recruitment Representative, Dept. CW1291, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer.

CP&L

Carolina Power & Light Company
Energy In Operation

COMPUTERPEOPLE -National Division-

Permanent & consulting opportunities both hourly and salaried nationwide.
We can provide a high level of professional representation to individuals with skills in the following areas.

C/UNIX $30-55K
Relational Database (Oracle, Tuxedo, Sybase) Colleen Windows (X and MS Windows) Graphics Dev (PHIGS & plus) Networking (X.25, TCP/IP)

IBM MAINFRAME
DATABASE $30-55K
IDMS/ADSO — Noreen
IMS (Telon a plus) — Noreen
DB2 — Noreen
ADABASE — Noreen

SYSTEMS 38/AS 400 $30-50K
RPG II, MAPICS, SYNON — Susan

Free Consultation
Call 1-800-955-9696
Fax Resume
1-716-883-6776
* Resume not required

Account Executive

Technical Marketing

FROST & SULLIVAN, the world's largest publisher of market research reports, is seeking a marketing professional to promote our products to the DP and Communications industries throughout the country.

The successful candidate will be responsible for all phases of new business development. Interaction with established accounts will be necessary in order to redefine and develop our products to meet our clients' needs.

Experience in sales, market research or product management with a technical background is required. Extensive domestic travel will be involved.

We offer a base salary plus commissions and comprehensive company paid benefits package. For consideration, send your resume including salary history and requirements, in complete confidence, to DIRECTOR OF HUMAN RESOURCES.

FROST & SULLIVAN, INC.
106 Fulton Street
New York, NY 10038
Equal Opportunity Employer M/F

DIRECTOR, INFORMATION SYSTEMS AND SERVICES

The University of Northern Colorado invites nominations and applications for the position of Director of Information Systems and Services. The Director is responsible for the strategic planning, leadership and coordination for both academic and administrative computing. This senior management position will direct and provide vision for the development, articulation, budgeting, and implementation of computing, networking, telecommunications, and information services at UNC. This position reports directly to the Vice President for Administrative Services and coordinates University computing activities with other State agencies.

The University of Northern Colorado, a senior public institution is located in Greeley. UNC enrolls over 10,000 students, offering degrees through the Ph.D., and has over 480 faculty members. Greeley is located 50 miles north of Denver, with a population of over 60,000.

The Director supervises a staff of approximately 30 full-time employees, and manages an annual operating budget of over $2 million, excluding capital outlay. The current UNC computing environment includes an IBM 3081-E32 mainframe running MVS and CMS applications and two UNIX microcomputers providing word processing capability. A UNIX MICROVAX II and ten public computing labs support the academic mission. UNC's INTERNET network includes communications access to other state and federal agencies and educational institutions.

Candidates must possess a master's degree and five years of progressively responsible experience in the management of educational computing. Candidates must demonstrate excellent oral and written communication skills, budgeting, planning and implementation capabilities, and strong organizational and interpersonal skills.

Applications must include a letter of application, a current resume, and the names/addresses/phone numbers of three references. Nominations will be accepted until January 11 and the review of applications will begin January 25.

The preferred starting date is April 1, but is negotiable. The starting salary will be $63,000 or commensurate with qualifications. University benefits may include health, life and dental insurance and the Colorado Public Employees Retirement program.

Nominations and applications should be sent to:

Julie Konzak, Chair
Search and Screening Committee

University of Northern Colorado

University of Northern Colorado
Carter Hall 2010
Greeley, Colorado 80639
(303) 351-2633

The University is an Affirmative Action/Equal Opportunity Employer. Qualified women, minorities, veterans and disabled persons are encouraged to apply.

Engineering Systems Engineer

Provides CAD/CAM/CAE software application support to customers who use these products in a wide variety of engineering and manufacturing processes. Interfaces with manufacturing engineers and designers when they encounter software errors and engineering design/analyses problems while using CAD/CAM/CAE software products during automotive design, analyses and manufacturing process.

Education: Bachelor of Science — Mechanical or Electrical Engineering

Experience: 2 years as an Engineering Systems Engineer working in a manufacturing/ engineering environment. Experience must include: use of three-dimensional CAD/CAM/CAE software, three-dimensional finite element modeling and analyses, interactive graphics programming and UNIX®/XENIX operating system.

The minimum working hours are 40 hours per week, with a starting salary of $34,020 per year. This ad is employer paid.

Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 92490.

®UNIX is a registered trademark of AT&T Bell Labs

An Equal Opportunity Employer
M F V H

Be A Part Of The Information Engineering Elite.

Eagles Internationals Advanced Technology Group is a recognized world leader in information Engineering

Phenomenal growth has created opportunities for highly qualified

Information Engineers	Expert Systems
IEF/IEW	A/I
AS 400/SYNON Designers	DB2 DBA's
DB2 Developers	ADA P/A P/L
AS, OS2 NOMAD	INFORMIX
LINIX, C, Xwindows, MOTIF	ORACLE

Write, phone or fax Mr. David H. Schwartz or Cynthia K. Cutler

Eagles International, where the rewards for performance are substantial.

EAGLES

EAGLES INTERNATIONAL
15851 Dallas Parkway, Ste. 675, Dallas, TX 75248
Phone (214) 450-5900 Fax (214) 450-5886

Senior International Sales Support Consultant responsible for design & implementation of customer events, corporate conferences, technical seminars & trade shows in support of Far East Sales division of large multinational computer systems & information networks supplier. Support sales in nine Far Eastern countries: China/ Hong Kong, Singapore, Korea, Taiwan, Malaysia, Thailand, Philippines & Indonesia. Duties require frequent involvement with the Far Eastern high tech market, its competitive environment & the cultural, business & regulatory conditions of each country. The objective of this U.S. Headquarters position is to leverage sales & increase market penetration in Far East. Candidate must effectively represent Far East sales organization to achieve sales objectives. Requirements are a Bachelor's degree in Business Administration with three (3) years experience in marketing communication & customer relations. Knowledge of Digital products & services including VAX, RISC, & Digital Networking Products, the Chinese Terminal & related software products. Fluency in both Mandarin and Cantonese with technical translation ability in computer technology for communication with local organizations & customers & sales background in the Far East is required. Salary: $41,000 per year. 40hr/week, 8:15 a.m. to 5:00 p.m. If you are interested in and qualified for the above position, please forward two (2) copies of your resume to: JO #1006, Commonwealth of Massachusetts, Department of Employment & Training, Special Programs, First Floor, 19 Staniford Street, Boston, MA 02114.

Why WTW?

Because You're The Best

Wesson, Taylor, Wells one of the nation's premiere software consulting firms – has challenging careers across the country for top programmer/analysts with application development expertise

DEC VAX, SMARTSTAR Rdb or Oracle
Senior Positions Jan. '91

Send resume immediately or call Wesson, Taylor, Wells

1-800-833-2895

WTW

An Equal Opportunity Employer

CA & AZ CONTRACTS

CONSULTANTS WANTED

P Murphy & Associates, Inc.

4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX (818) 841-2122

CONSULTANTS

Burroughs/UNC • Mac 40
VAX/Oracle • Ideal/Datacom
C++/Objor • Telephony
AS400 • VAX Cobol
DB2/CSP • Adabas/Natural
Notron • IDMS/DB2
VAX/Web/RDB
IMS/Cobol • Teradata

The Registry
1000 Park Forty Plaza
Durham, NC 27713
1-800-336-9119
The Registry FAX (919)544-9886

Ask for Chris or Carolyn
Member NACCB

EXECUTIVE DIRECTOR

Digital Dealers Association is seeking a full-time principal executive for the Association. He/she will be responsible to the overall management of the Association and oversees the operation of the administrative office. He/she must be familiar with DEC procedure and policies and be qualified to represent the Association in industry related groups and meetings. Salary and location are negotiable. Please send letter, resume, and the names, addresses and phone numbers of three references by Jan 20, 1991, to Digital Dealers Association, 107 S. Main St. Ste 202, Chelsea, MI 48118.

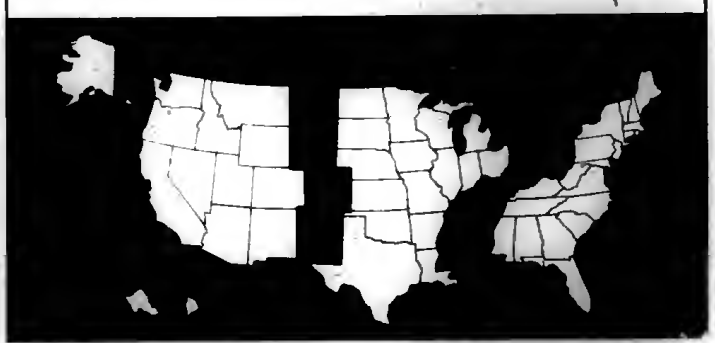
Weekly. Regional. National. And it works!

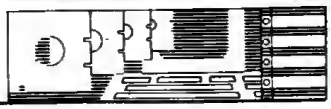
Just four reasons why more companies run more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

For more information or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National.
And it works.

An IDG Communications Publication





There Is A Company That Believes...

Success is the stepping-stone for further progress

There is that place in time in the progress of a company, when it stands at the threshold of an era of splendid opportunity. For Glaxo Inc. that time is now. We have worked hard to make that happen — with high spirit and a strong belief in the abilities and commitment of people. Come to Glaxo, one of the largest pharmaceutical firms in the U.S. and demonstrate your commitment and proven capabilities. We currently have the following position available at our Corporate Headquarters located in Research Triangle Park, N.C.

ADVISORY OFFICE AUTOMATION ANALYST

This position, in our MIS Department, will be responsible for providing technical consultation and user training for office automation hardware and software needs in support of our research and development division. Individual will also perform system analysis for the implementation of office automation systems.

Background must include a Bachelor's degree in Computer Science (advanced degree preferred) with a minimum of 5 years experience in MICROS, IBM personal computers, mainframes, and related OA software. Experience in a DEC/VAX environment is required.

Research Triangle Park, North Carolina offers a lot more for people who seek a well-rounded, comfortable lifestyle. This world-famous scientific/industrial/academic community near Raleigh, Durham and Chapel Hill, affords access to respected universities, beautiful residential areas, major retail centers, excellent health care and abundant cultural and recreational facilities. And people like you.

Join us and enjoy excellent pay, flexible benefits, an on-site recreation and fitness center, a spirit of enthusiasm and teamwork and outstanding opportunities for career satisfaction. Send your resume, including salary history, to: **Human Resources Department, Job #3650B117-CW, Glaxo Inc., P.O. Box 13398, Research Triangle Park, N.C. 27709.** (No phone calls or agency referrals, please.) An Equal Opportunity Employer M/F/H/V

Glaxo Inc.

Our belief begins with you.

AGS, THE LEADING EDGE COMPANY — TO LEAD YOU THROUGH THE 90's

Success in the 90's will require experience and stability, two of AGS' strongest qualities. While we've always placed a high priority on staying at the very forefront of information technology, we also take pride in our company's history. Since 1967, AGS has played a major role in the design of computer software solutions for Fortune 500 companies in every industry. Our tradition includes long-lasting relationships with top 100 companies. So, while other computer consulting companies can talk about being on the leading edge, AGS' professionals can say that they actually helped to create it.

With over 3,000 employees working in offices throughout the United States and Europe, AGS is now the largest member of the NYNEX Information Solutions Group. If you're looking for an organization that can provide the excitement of state-of-the-art projects along with the security of a company that's backed by NYNEX–a $13.2 billion organization–AGS is the place for you. We have outstanding career opportunities throughout the country for computer professionals with experience in a variety of technical areas including:

- **Database or Telecommunications in an IBM environment including Mainframe and Mid-range.**
- **Database or Telecommunications in a UNIX * environment.**
- **Banking, Finance, Insurance or Manufacturing.**

We offer extremely competitive salaries, relocation assistance, excellent medical and dental benefits, in-house educational training and flexible career pathing.

Spend the 1990's enjoying the best of both worlds: professional challenges and career stability. When you're on the AGS team, you don't have to choose. For immediate consideration, call or send your resume to:

Loree Tisdale
Senior Technical Resources Manager
National Recruiting
AGS Information Services, Inc.
1139 Spruce Drive
Mountainside, NJ 07092-0996

(800) HIRE AGS
FAX (201) 654-6794

AGS: WHERE ALL THE OTHERS WANT TO BE

AGS A NYNEX Company

An Equal Opportunity Employer M/F/H/V
* UNIX is a tm of AT&T

Arizona California Colorado Connecticut
Delaware Florida Georgia Illinois Indiana
Maryland Massachusetts Michigan New Jersey
New York North Carolina Ohio Pennsylvania Texas

USA FUNDS

COMPUTER PROFESSIONALS IT'S PRIME TIME AT USA FUNDS!

Join the excitement with the nation's leader in student loan financial services.

Due to our continual success, we have created new opportunities to assist in the expert operation and expansion of our state-of-the-art information systems. We offer a competitive salary and comprehensive benefits package.

OUR ADVANCED TECHNICAL ENVIRONMENT INCLUDES:

- IBM 3090-200 running MVS
- IDMS/R database system
- a sophisticated robotics tape librarian
- AS/400 mini-computer technology
- a nationwide computer network linking over 1500 terminal devices to our corporate data center
- CASE tools such as Excelerator
- Information Engineering techniques

SYSTEMS DEVELOPMENT MANAGER
Qualifications:
- 5 years experience as a Project Manager
- Supervised 10 or more DP professionals
- Experience in the use of Systems Development Life Cycle Methodologies

SYSTEMS ANALYST
Qualifications:
- 3-4 years experience as a Project Leader
- 2 years high level programming experience
- Experience in the use of Systems Development Life Cycle Methodologies

INFORMATION ENGINEERING MGR
Qualifications:
- Expertise in Systems Development Life Cycle Methodologies such as Information Engineering
- Experience in leading or supporting project teams in use of methodology

PROGRAMMER/ANALYST
Qualifications:
- Strong COBOL programming skills
- Exposure to database and on-line technology
- 2 years IBM mainframe experience preferred

If you have a **B.S. in Computer Technology or relevant work experience** and want the right career opportunity, submit your resume and salary requirements in complete confidence to:

United Student Aid Funds, Inc. • 8115 Knue Road
Indianapolis, IN 46250 • Attn: Human Resources

or call our Technical Recruiter for a confidential interview **(317) 845-7896**

Equal Opportunity/Affirmative Action Employer

ONE GREAT COMPANY. ONE GREAT CITY.

Coca-Cola USA, the domestic soft drink division of the Coca-Cola Company, is experiencing significant growth in our Information Services Organization. Our IS environment includes state-of-the-art, 4th generation language development, a formal systems development life cycle methodology, relational databases (including DB2), distributed systems, CASE tool technologies and on-line interactive systems development, all involving IBM MVS mainframe and mid-range systems.

Our corporate headquarters is located in Atlanta, Georgia, home for the 1996 Summer Olympic Games. An appealing lifestyle, our mild but seasonal climate, good schools, and diverse cultural activities make Atlanta an ideal place to call home.

We are currently seeking highly motivated, proven performers to join our staff. Positions include, but are not limited to:

PROGRAMMERS — **DATA ANALYSTS**
PROGRAMMER ANALYSTS — **DATA BASE ANALYSTS**
SYSTEMS ANALYSTS

If you're a Systems Professional with a minimum of 3 years work experience, we'd like to hear from you. We prefer recent experience in one or more of the following environments.

DB2 — **PL/1**
COBOL — **AS400**
DATACOM — **RPGIII**
IDEAL

For confidential consideration, please send your resume to: **Coca-Cola USA, Dept. SPVT CW0102, P.O. Drawer 1734, Atlanta, GA 30301.** An Equal Opportunity Employer.

Coca-Cola USA
Division of
The Coca-Cola Company

Data Processing
ATLANTA SOUTHEAST
(404) 447-8773

Contract or Permanent Employment Available

"TOP RATES and SALARIES"

BRANNON & TULLY

Software and Services
HIRING NOW!!!
AS/400, RPG III
AS/400, COBOL
DB2, IMS DB/DC
COBOL, CICS, VSAM
DEC, COBOL, DIBOL
TANDEM, TAL, COBOL
C, MS/DOS, UNIX
ADABAS, IDMS
DEC, FORTRAN

Brannon & Tully, Inc.
3100 Holcomb Br. Rd. Ste 575
Norcross, GA 30071
404-729-9893 Fax #
404-447-8773

AS/400 S/38

GET TO THE HART OF THE BUSINESS...

With Whittman Hart, the largest diversified technical services company (dedicated strictly to the AS/400 and S/38 systems) in the country. Providing technical support to many of the top Fortune 20 companies in America, we are the consulting experts, committed to mastering technologies, attending to details and creating solutions. Our accelerated growth and phenomenal success have created a need for talented Data Processing PROFESSIONALS to share in a future of significant challenge and reward in a highly progressive team environment.

We currently require individuals with 2+ years solid System 38, or AS400 experience, RPG III and proficiency in any of the following:

- **Technical Consulting**
- **Design**
- **Education & Training**
- **Data Communications**
- **Project Management**
- **Product Development**

POSITIONS ARE CURRENTLY AVAILABLE IN CHICAGO, LOS ANGELES AND INDIANAPOLIS.

Get in the HART of challenge and reward at Whittman Hart. We offer one of the finest compensation packages in the industry, including high earning potential, project diversity, incentives, paid insurance coverage, relocation allowance and other impressive benefits. Please send your resume in strict confidence to: **Jarud Bobo, Director of Recruiting, Whittman Hart, 577 East Butterfield Road, Suite 425, Lombard, IL 60148. (708) 971-2278.** Equal Opportunity Employer M/F

Whittman-Hart

The Leader in IBM Midrange Solutions

MARKETPLACE

Buyers' wish list

If you had an extra million dollars to spend, what would you buy?

Atlantic Steel's *Graham*

If this were a contest for the neediest company, I think we would win! Our IS department would be a prime example of making a system work with baling wire. We've got some good equipment; it's just outmoded. First of all, I'd want a larger CPU than our IBM 4341. Something above an IBM 4381. I would move from tape drives to cassettes. I'd put in either a token-ring or Ethernet network for my 42 personal computers. I would boost transmit rates up from 56K bit/sec. between my plants in Atlanta and Cartersville, [Ga.]. I have no disaster recovery. I want that. I would have maintenance on all my equipment.

Richard Graham
Director, MIS
Atlantic Steel Co.
Atlanta

Turner Broadcasting's *Johnson*

What I'd do is take that money and replace the rest of my outmoded private branch exchanges. I've got some locations that can use some new ones. In this way, I would be able to control all of our PBXs from a central location. I could program, do moves, adds, changes and so forth without having to dispatch someone to the remote site or call one of the regional Bell operating companies.

Michael Johnson
Corporate Director
MIS and Telecommunications
Turner Broadcasting System, Inc.
Atlanta

Revlon's *Hoffman*

I'd like to take the million dollars and somehow get a perfectly designed system. Or I would take the money and put it all into debugging every problem that exists so I can walk into next year without an open item on my request list. But on a more practical level, I'd go for laptop computers for my field reps. Then I'd upgrade my IBM Application System/400 for distributed processing to get the information out to the field. If I had anything left over, I would work for sales force automation to produce sales presentation information for the field.

Steve Hoffman
Director of Information Services
Beauty Care Division
Revlon, Inc.
New York

If I had $1 million, I would invest it in the best digital PBX I could possibly get my hands on — one that would be capable of robust yet seamless integration with my business and publishing systems. I would then invest whatever resources would be necessary to build applications to take advantage of that integration, such as telemarketing, database marketing and autodialing. We'd do a lot more with computer-integrated telephony than is currently being done. This all would cost a lot more than a million, but I'd be happy.

Robert Murphy
Director of Information Services
The Boston Globe
Boston

I would throw out all the old printers that we have now and buy everybody a new laser printer. We have an AS/400, so I would buy additional hard disks for more storage space. We hardly have any 80386-based PCs, so I would probably purchase 50 PCs, which would be about $150,000. One technology that I would love to get in here that I would never even consider because we'd never have the budget is PC networks. I would consider purchasing a Compaq Systempro, using that as a file server for all of the machines and see if we could tie everyone into our AS/400 that way.

Bob Curtis
Manager of MIS
New World Entertainment
Los Angeles

I don't know how wild and crazy this is, but I would invest the money in an image processing system — with scanning, file storage and optical disc. I'd buy such a system so we could store the images of leases and things of that nature. This ability would be extremely helpful — we're in the commercial real estate business. On the other hand, if I had all the money in the world to play with in my budget, I would invest it in wireless transmission so that I could eliminate our fiber-optics network, our coaxial cables and all that nuisance stuff.

Dave Luce
Corporate Director of IS
The Rockefeller Group
New York

The Boston Globe's *Murphy*

New World's *Curtis*

Rockefeller Group's *Luce*

Buy/Sell/Lease

COMPUTER ROOM EQUIPMENT

LIEBERT
Computer Room Air Conditioners
3 thru 22 Ton Units
Main Frame Chillers
3 thru 12 Ton Units
Power Distribution Units
30 thru 225 KVA

PILLER
40 & 75 KVA Standblocks

LIEBERT, EXIDE, EMERSON EPE & IPM
18.75 - 500 KVA UPS Systems

RAISED ACCESS FLOORING
Thousands of square feet in stock, wood and steel.

All items listed are reconditioned with warranty

dp support
DP SUPPORT
P.O. Box 1409
Plano, TX 75086
214-422-4651
214/578-1228 Fax

Go Shopping in... Computerworld's
CLASSIFIED MARKETPLACE
Call for all the details
(800) 343-6474
(In MA., (508) 875-5700)

IBM SPECIALISTS
SELL • LEASE • BUY
S/[illegible] S/36 S/38 AS/400
5711 5712
800-251-2670
CMA COMPUTER MARKETING
PO BOX 71 • 810 BRYAN ST. • OLD HICKORY, TN 37138

Buying Selling
DEC • SUN
Data General
Plus
All Peripherals
Call DCC
617-837-7255
or
301-750-7200

AMDAHL 5870 48/32
Two Processors
FOR SALE OR LEASE
HARRIS LEASING CORPORATION
DAYTON, OHIO
(513) 296-1320

The BoCoEx index on used computers

Closing prices report for the week ending December 14, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$300	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,500	$2,625	$1,500
Portable 386	$2,400	$2,800	$2,300
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,000	$1,300	$975
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,450	$1,100
II	$2,550	$2,900	$2,400
IIFX	$6,500	$6,900	$6,400

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Buy/Sell/Lease

CALL 1-800 345-9370

9370
IN-HOUSE TECHNICIANS
Buy
Sell
Lease
SSI
simon systems inc.

IBM BUY (800) 888-2000
LEASE
SELL
9370
4381
SYSTEM 36/38
AS/400
SERIES 1
POINT OF SALE
• Processors
• Peripherals
• Upgrades
Dempsey

• Trade
• Lease
IBM
SYSTEM 36/38
4300
SYSTEM AS/400
SERIES 1
MEMBER OF CBMA
• SPECIAL LEASE RATES ON AS/400's
• Buy • Sell • New • Used
MEMBER OF VAR
(800)6789-IBM

VAX RENTALS
MV 3600
MV 3800/3900
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals
• Fast Turnaround • Dependable Products
• Upgrade/Add-On Flexibility
BROOKVALE ASSOCIATES
CBMA ddo
EAST COAST (516) 273-7777
WEST COAST (206) 392-9878

Currently replacing Series/1's with the new RS/6000 line via EDX to AIX migration
612-942-9830
DATATREND

SPECTRA
EQUIPMENT CORPORATION
(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX
BUY SELL RENT LEASE
IBM XEROX
ANAHEIM CORPORATE CENTER
5101 E. La Palma Ave
Suite 206
Anaheim
California 92807
LOS ANGELES
SAN JOSE
SEATTLE

9370, 4381	MicroVax	2700
AS400, S/36,S/38	VAX 6000	3700
Point of Sale	VAX 8000	4050
CAD/CAM	PROCESSORS	4090
Series/1	PERIPHERALS	8790
Banking	UPGRADES	9790

Integrity . . . the Spectra difference!
A full line IBM and Digital computer dealer

IN STOCK
Call us for a quote
708-831-1255
Executive Inforesource
1530 Eastwood Ave., # 100
Highland Park, IL 60035
CBA

Associates Inc
• Data General
• Fujitsu
• Data Products
• CDC
• Printronix
• Zetaco
BUY SELL TRADE
617/982-9664
FAX: 617/871-4486

New/Reconditioned
digital
Equipment
Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!
CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC maintenance.
Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.
CSI Computer Systems, Inc.
93 Eastman St.
Easton, MA 02334
Call Toll-Free
1-800-426-5468
In Mass. (508) 230-3700
FAX (508) 230-3299

Save 50%
REFURBISHED
WANG
VS • OIS • PERIPHERALS
PCs AND LASER PRINTERS
■ Disk Drives, Memory Upgrades, Peripherals and Wang-compatibles
■ All equipment guaranteed acceptable for Wang or third-party maintenance.
In Stock for Immediate Delivery Buy, rent or lease
New Wang PCs* at exceptional savings.
wpb
Authorized Wang PC Dealer 1-800-223-9264
Office Automation Experts Since 1978 *New Wang PCs sold in Wang's Eastern Zone and Southern California only

WE BOUGHT
IBM
By the thousands.
As a result of our thousands of purchases of new and used IBM systems of all sizes, shapes and descriptions, we are offering you great savings on IBM AS/400's, 36's, tapes, drives, printers and peripherals, as well as all upgrades.
As a specialty, we offer multiplexors, modems, protocol converters and PS/2's.
If you have a need to buy or sell, call us first and DEAL DIRECT with the..
COMPUTER MARKETPLACE
800-858-1144
CBA
In CA. dial (714) 730-3102, 200 East 9th Street, Corona, CA 91719
IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES INC

MAI
BasicFour
MPx 9410
Sale or Lease
Call 617-267-8600

PCM
PERIPHERAL COMPUTER MARKETING INC
Buying used IBM equipment:
▶ 3380 - Disk
▶ 3480 - Tape
▶ 3880-X23 - Cache Controllers (any model)
▶ 3990 - Controllers
*** Eligible for IBM M/A
Call Chris Bratun
(216) 892-3990
END-USERS ONLY

HONEYWELL
NEW/USED EQUIPMENT
• All Models
• Ultimate Equipment
• Older Equipment Available
• Buy-Sell-Lease-Trade
PARTS & REPAIR
FULLY GUARANTEED
PROMPT DELIVERY
Call Level 6 Systems
1-216-951-2221
BULL

HP HP HP HP
NEW and USED
1000 • 3000 • 9000
Including Spectrum
BUY • SELL • TRADE • RENT • LEASE
Processors • Peripherals • Systems
All In Stock - Immediate Delivery
All warranted to qualify for manufacturer's maintenance
ConAm Corporation
It's Performance That Counts!
800/926-6264 213/419-2200
FAX 213/419-2275

It's the
CLASSIFIED MARKETPLACE
Reach Computer Professionals Where They Shop For:
☐ Buy/Sell/Lease ☐ Hardware
☐ Software ☐ Peripherals/Supplies
☐ Communications ☐ Graphics/Desktop Publishing
☐ Time/Services ☐ Bids/Proposals/Real Estate
☐ Conversions ☐ Business Opportunities
CALL NOW!
(800) 343-6474
(In MA., 508/879-0700).

FOR SALE
FPS Computing System Model 64/164
Will configure with Disk, Memory & Max. Boards to meet your needs. Other FPS Computing Systems available
International Computing Systems
800-822-4372
Fax: 612-935-2560

CALL TODAY FOR A QUOTE!
1-800-ICE-BUYS
BUY • SELL • LEASE • NEW • USED PERIPHERALS • SYSTEMS • UPGRADES
digital
Data General
sun
apollo
IBM

Apollo DN2500 New loaded $7,500	IBM New 3AF2933 4MB Mem $850
VAX Station 3100 mod 30 New $9,500	IBM New 6450604 2MB Mem $350
VT 402 New $495	
VT 320 New $420	
VT 220 New $225	

TEL.: (617) 585-8488 . FAX: (617) 585-9177
163 MAIN ST. . HINGHAM, MA 02043
ICE
INTERNATIONAL COMPUTER EXCHANGE, LTD.

CB CB CB CB CB CB CB CB CB CB CB CB CB CB
WE
Buy - Sell - Lease
New and Used IBM Equipment
AS400 - System 36, 38, 43XX
SHORT TERM RENTALS
Call 800-238-6405
IN TN 901-372-2622
COMPUTER BROKERS, INC.
2978 Shelby St., Memphis, TN 38134
"Since 1974"

CLASSIFIED

Books

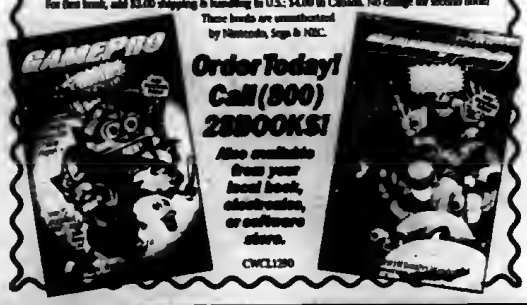
Nintendo, Genesis, & TurboGrafx-16 Hot Tips & Tactics Guides!

Perfect stocking stuffers! These game-winning books from GamePro Magazine are available in Sports or Adventure games versions. Each book is 200 pages, full-color, and packed with over 750 game tips, tactics, passwords, and strategies, on more than 75 of the most popular games! Plus, all major systems–Nintendo, Genesis, & TurboGrafx-16!

~ GamePro Hot Tips-Sports Games, $9.95
GamePro Hot Tips-Adventure Games, $9.95

For first book, add $3.00 shipping & handling in U.S.; $4.00 in Canada. No charge for second book!

These books are unauthorized by Nintendo, Sega & NEC.



Order Today! Call (800) 2BBOOKS!

Also available from your local book, electronics, or software store.

CWCL1290

Software

KeyEntry III

REPLACE DEDICATED DATA ENTRY SYSTEMS FRONT-END MAINFRAME APPLICATIONS

- LAN or stand-alone environments
- Two-pass verification
- Batch balancing and check digits
- Operator statistics reporting
- Embedded-numeric keypad emulation
- Extensive field edits and table lookups
- Screen Painter and MenuManager included
- Batch Control System and Reformat utility
- User-definable help screens and windows
- OS/2 version
- Outstanding customer support
- Thousands of users worldwide
- French, Spanish, and German versions
- Consulting, conversion and integration services

FREE evaluation systems available for qualified companies.

1-800-533-6879

SUN-TIMES COMPUTER SYSTEMS, INC.
2732 Seventh Avenue South • Birmingham, AL 35233
PHONE (205) 251-1580 • FAX (205) 322-4851

The Only Real Concept Based Text Retrieval Software.

///ETA///ORPH

THUNDERSTONE™ Software-Expansion Programs Int'l., Inc.
2488 Superior Viaduct NE, Cleveland, Ohio 44113
Phone: (216) 771-7880 fax: (216) 771-7884

COMPUTERWORLD
Classified Marketplace
showcases your ad by product category!

Whether it's used equipment, software, time, services or just about any other category of computer product or service, *Computerworld's* Classified Marketplace is organized to make your ad visible and to make buying your product easy.

Just look!

Computerworld's Classified Marketplace Product Categories

software
hardware
conversions
PC products
time/services
buy/sell/lease
communications
bids/proposals/ real estate
graphics/desktop publishing
peripherals/supplies
business opportunities

So if you're selling computer products or services, advertise in the newspaper that showcases YOUR product or service. Advertise in *Computerworld's* Classified Marketplace!

For more information, call

800/343-6474
(in MA, 508/879-0700)

Conversions

Automated Conversions to AS/400
from
1. IBM MAINFRAMES, CICS & Batch COBOL. Up to 65% cheaper/75% quicker than manual conversion. Industry proven.
2. NON-IBM Wang, Unisys, Honeywell, etc
3. PAPER DOCUMENTS Imaging Systems on PCs and/or AS/400 Call for details

CSI Inc.
150 Lafayette Street, Suite 800, NYC, NY 10013
Phone: (212) 431-4004 • Fax: (212) 431-4109

CONVERSION SERVICES

Dedicated Wordprocessors
9 Track Mag-Tape
Glc Cartridge Tape
Unix and Xenix Systems
VAX/VMS Backup Tapes
Apollo, Sun, Unisys, NCR

Call: 203-630-3123 or
203-630-7304 or
203-853-0837

SCAN DATA

Business Opportunities

ARE YOU CONNECTED?

To increase your sales and profits you need connections. Connections to help staff your outstanding contracts. Connections to help place your available staff.

That's NATIONAL CONTRACT NETWORK... the nation's first cooperative network of contract programming businesses! Our unique networking system enables members to work together filling contract opportunities, placing candidates and sharing the profits!

NATIONAL CONTRACT NETWORK memberships are limited to a "protected" territory, so call or write today for more information and an application. If you qualify, it will mean a whole new profit potential for your company because now you're connected!

NATIONAL CONTRACT NETWORK
5500 Main St., Williamsville, New York 14221
(716) 632-1133

PC Rentals

PC RENTALS

Also Available:
- IBM PS/2
- Compaq
- Macintosh
- Laser Printers
- Laptops
- Portables

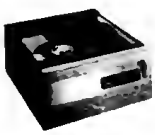
Next Day Delivery Anywhere in the U.S.A.

Computer Rental

1-800-765-4727

Peripherals/Supplies

9-Track Tape For Your IBM PC/XT/AT/PS-2™



Read 1600 or 6250 bpi 9-track tapes from a micro, mini or mainframe in EBCDIC or ASCII as mirror image or by individual files.

Use the 2000 PC™ for disk backup, data interchange or archival storage

PC/AT/AT/PS-2 are trademarks of IBM

Power In Value

DIGI DATA CORPORATION
8580 Dorsey Run Road
Jessup, MD 20794-9990
(800) 782-6395
FAX (301) 498-0771

COMPUTERWORLD
Classified Marketplace

delivers your message in companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call:

800 343-6474
(in MA, 508/879-0700)

612,000 MIS DP Professionals see the CLASSIFIED MARKETPLACE each week

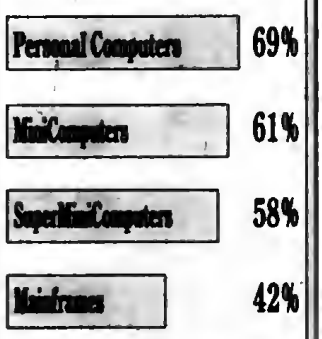
Call for advertising information

(800) 343-6474

ANOTHER REASON WHY COMPUTERWORLD'S MARKETPLACE PAGES WORK ...

Computerworld's Classified Marketplace gives you buyers with extensive purchase influence. In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of computers - from PCs to minicomputers, superminis to mainframes.

Involvement in the Purchase of Computer Systems by Computerworld Subscribers in User Organizations*



* Source: STAT Resources Profile of Computerworld Subscribers, November 1987.

To place your ad, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
Where all computer buyers and sellers go to market.

Time/Services

CLASSIFIED MARKETPLACE

Where Computer Professionals Shop

(800) 343-6474
(in MA 508/879-0700)

ON-LINE WITH COMPUSOURCE

- Multiple centers
- RACF, CICS, IMS
- Volume & term discounts
- Full technical support
- Disaster recovery services
- MVS/XA, VM, DOS
- SAS, DB2
- Worldwide access
- Laser printing

COMPUSOURCE
(919) 469-3325

SUNGARD

- OUTSOURCING EXPERTISE
- FIXED PRICE COMPUTING
- ECONOMICAL PRICES - SIGNIFICANTLY LESS THAN IN-HOUSE
- IBM 3090 COMPUTERS WITH MVS/SP4, AND VM TECHNOLOGY
- EXTENSIVE NATIONWIDE TELCOM NETWORK
- EXTENSIVE LIBRARY OF THIRD PARTY SOFTWARE
- PROFESSIONAL SERVICES FOR APPLICATION SUPPORT & DEVELOPMENT

FOR MORE INFORMATION CALL:
(800) 441-4328 (215) 387-3600
(215) 940-6540

SUNGARD COMPUTER SERVICES INC.
1285 DRUMMERS LANE
WAYNE, PA 19087

Financial Technologies

Innovative, Responsive, Quality

a few words that describe the most complete computer processor offering.....

IBM 3090, MVS/XA, MSA, DB2, VM/HPO, TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

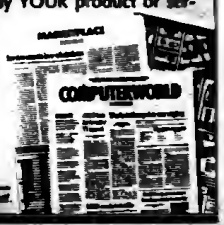
1-800-443-8797

14300 Sullyfield Circle
Chantilly, Virginia 22021

Classified Marketplace

delivers your message in companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!



For more information, call:

800/343-6474
(in MA, 508/879-0700)

COMPUTERWORLD
Where all computer buyers and sellers go to market.

ICOTECH

MVS/XA	VTAM	DB2
TSO/ISPF/SDSF	FILE-AID	SIMWARE
CICS	INTERTEST	ACF2
ADABAS	SAS	ADC2
LIBRARIAN	$AVRS	

- 24 hour availability
- International access
- Superior technical support staff
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery
- Impeccable service

Call Now - Solve Your Computing Worries
TODAY & TOMORROW !!!
(201) 685-2400

QUALITY COMPUTING SERVICES

PROCESSING & SYSTEMS OPERATIONS
OUTSOURCING
FACILITIES MANAGEMENT
REMOTE COMPUTING / TIMESHARE

SYSTEMS PLANNING & CONSULTING
STRATEGIC SYSTEMS PLANNING
NEEDS ANALYSIS / FEASIBILITY
QUALITY ASSURANCE PROGRAMS

PROJECT MANAGEMENT
PROJECT LEAD / CONSULTANT SUPPORT
SYSTEMS DEVELOPMENT
SYSTEM / DATA CONVERSIONS

For more information contact Susan Roush at: (206) 924-2527 or (800) 654-9347

Weyerhaeuser Information Systems

Bids/Proposals/Real Estate

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

RFP No. 1918, due Thursday, January 17, 1991 at 3:30 p.m. for the acquisition of a LAN with connectivity to the State Computer Center IBM 3090 mainframe for the CENTRAL DATA PROCESSING AUTHORITY, Bureau of Systems Policy and Planning.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2804

DATA PROCESSING MANAGEMENT ASSOCIATION EDUCATION FOUNDATION

Invites you to review and respond to our

REQUEST FOR PROPOSAL

INFORMATION SYSTEMS - COMMON BODY OF KNOWLEDGE

For a copy of the RFP, contact:

EXECUTIVE DIRECTOR
DATA PROCESSING MANAGEMENT ASSOCIATION
505 Busse Highway
Park Ridge, IL 60068
(708) 825-8124

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

General RFP No. 1901 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of ADABAS Data Base Management System compatible support products for the STATE COMPUTER CENTER.

General RFP No. 1902 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of dedicated word processing/typing systems for MISSISSIPPI GOVERNING AUTHORITIES.

General RFP No. 1903 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of data processing/telecommunications clerical contract personnel services for the STATE OF MISSISSIPPI.

General RFP No. 1904 due 3:30 p.m., Tuesday, January 22,1991. This is a general RFP to for used through January 1992 for the acquisition of consulting services to address upcoming project needs in the areas of feasibility study, systems analyses and design, and system development and implementation for the STATE OF MISSISSIPPI.

General RFP No. 1905 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of PC-level graphics and small CAD systems for the STATE OF MISSISSIPPI.

General RFP No. 1906 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of IBM compatible mainframe system software for the STATE OF MISSISSIPPI.

General RFP No. 1907 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of IBM common systems parts and peripherals for the STATE OF MISSISSIPPI.

General RFP No. 1908 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of IBM 327X compatible CRTs, printers and controllers for the STATE OF MISSISSIPPI.

General RFP No. 1909 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of telecommunications analog modems, digital service units, and multiplexers for the STATE OF MISSISSIPPI.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2804

OUTSOURCING AND REMOTE COMPUTING

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
  - Media Conversion
  - Laser & Impact Print Facility
  - Application Programming
- Technical Support
- 24 Hours a Day - 7 Days a Week

May & Speh, inc.

1501 Opus Place, Downers Grove, IL 60515-5719
1(800) 729-1501
For More Information Contact: Tony Ranieri

ANOTHER REASON WHY COMPUTERWORLD'S MARKETPLACE PAGES WORK ...

Computerworld is the only computer publication to give readers an established classified advertising resource for over two decades! And since Computerworld has been the weekly computer newspaper of choice since 1967 - that means Computerworld's loyal readers will expect to see your classified message in Computerworld's Marketplace Pages!

To place your ad, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where all computer buyers and sellers go to market.

It's the ***Classified Marketplace***

Reach Computer Professionals Where They Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

CALL NOW

800 343-6474
(in MA., 508/879-0700)

REMOTE COMPUTING

- We locate COMPUTER TIMESHARING, including OUTSOURCING on ALL mainframes.
- Since 1968 we have found your LOWEST prices from over 800 nationwide data centers.
- NEVER a charge to the Buyer, because our fee is paid by the Seller.

CALL DON SEIDEN AT

COMPUTER RESERVES, INC.
(201) 882-9700

REMOTE COMPUTING OUTSOURCING

- MVS/XA
- CICS
- DB2
- VM/370
- TSO
- IMS/DBDC
- DOS/VSE
- CMS

OVER 150 SOFTWARE PRODUCTS
- DEVELOPMENT
- PRODUCTIVITY
- DEBUGGING
- PERFORMANCE

- TELENET
- SPRINT
- TYMNET
- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS INFORMATION SYSTEMS, INC.
New England
708-574-3636 617-

COMPUTERWORLD
CLASSIFIED MARKETPLACE

Examines the issues while computer professionals examine your message. Call for all the details.

(800) 343-6474
(in MA., 508/879-0700)

OUTSOURCING SERVICES

IBM MVS/XA • VM/CMS
TSO • SUPERWYLBUR • CICS • CMS
Extensive Library of 3rd Party Software

"We offer fixed price solutions"

- Professional Services
- Laser Printing
- Capacity Planning
- Nationwide Network
- 24 Hrs/Day * Days/Week
- Over 25 Years Experience

COMPUTER NETWORK SYSTEMS, INC.
(202) 537-2500
5185 MacArthur Blvd., N.W. • Washington, D.C. 20016

Worker education: a magic act?

Tight budgets are forcing companies to rethink their training techniques

BY JILL VITIELLO
SPECIAL TO CW

What's in store for training aficionados next year?

The general consensus, according to industry experts, is that technical training in 1991 must educate, inform and entertain more than ever to keep up with the demands of a work force that is becoming more technically sophisticated.

However, training managers and experts predict that budgets will continue to shrink, less expensive, self-paced, computer-based training (CBT) will skyrocket, and trainers themselves will need to change their ways.

While companies are beginning to pay attention to the competitive importance of proper technical training, they are putting little focus on actual training budgets. Furthermore, according to experts, training budgets will continue to be the first to get cut in crunch times. One way that cuts are now being made is by downsizing the training department.

As a result, fewer people are doing more work. Trainers are starting to think differently about how they do their jobs, says Fran Hall, a spokeswoman at DBMI Courseware Developers in Manchester, Conn. The most dramatic shift is a move away from instructor-led training to technology-based methods because they are less expensive. For example, Applied Technologies Group in Waltham, Mass., is relying heavily on CBT because it saves time and money, says Charles Barnicoat, group IS manager at the firm.

Technical advancements

A second reason for the increase in technology-based instruction, such as CBT, multimedia and self-training packages, is advances in areas such as optical storage on personal computers, compact disc/read-only memory and interactive digital video.

"CBT packages, which took a bad rap in the past, are now of a much better quality," says Ted Smith, manager of systems development at Union Carbide Corp. in Danbury, Conn. "The actors seem more realistic and knowledgeable, and the content has improved."

Time savings and a higher rate of learning retention among students are further strengthening the push for self-paced, technology-based training. In a study conducted by California State University at Fullerton, interactive videodisc training allowed students to learn in half the usual amount of time with a 40% greater retention rate and 300% greater mastery rate than is found with traditional instructor-led training.

However, people still find value in instructor-led training, according to Kelly Miller, national training coordinator at Logical Operations, Inc. in Rochester, N.Y.

For example, one major financial institution recently dropped its video-based training after finding that employees perform better with stand-up lectures, according to Gary Audin, president of Delphi, Inc., a training firm in Pompton Plains, N.J. Now the company uses CBT as an auxiliary training method for review or for those students with scheduling difficulties.

"In determining how to conduct training for 1991, we have to remember that different media work for different audiences and subjects," Audin says.

Smith agrees that a blend of training methods, such as mixing video with hands-on exercises, works best.

Trainer tracks

With the overall shift toward more technology-based self-training, a question lurks in the background: Where will that leave the trainer?

Elliot Masie, director and founder of the Association for Computer Training and Support in Raquette Lake, N.Y., predicts the evolution of a new kind of trainer, one who is an "applications coach." He envisions the training situation of the future this way: Eight students work independently on computer-based training modules. The applications coach roams the classroom, offering help and guidance as needed. Later, the coach is available for on-site support when the students return to their jobs.

Others say that trainers will have to be more versatile. "Trainers will want to use the full tool kit of instructional technologies to support the work force," says Bonnie Williams, vice president of sales and marketing at CES Training Corp. in Paramus, N.J.

Dan Roberts, vice president of Ouellette and Associates, Inc., a training firm in Bedford, N.H., says trainers must also be technicians. "If you haven't walked in the technical person's moccasins, you have no credibility with the people you're trying to train. Unless you've lived in the technical world, you can't customize training to meet the needs of those who live there every day."

A different direction

Clearly, training is heading in a new direction in 1991 and will require trainers and their departments to do some fancy footwork to keep up with tight budgets and increased demands.

With these pressures creeping into the picture, it will be tough for trainers to keep their objectives in sight in 1991.

"Technology is a resource, just like people, capital and time," says Vickie Walker, director of IS education at Aetna Life Insurance Co. in Hartford, Conn.

"If we are committed to advancing people through the corporation, we must help them by providing good training," she adds.

Despite the trends, trainers must keep their eyes on the mission of fitting training and methods to changing company needs.

Vitiello is a speech writer and freelance journalist based in East Brunswick, N.J.

PROMOTING A BETTER UNDERSTANDING OF
INFORMATION ENGINEERING

CEC is pleased to present the 1991 public offerings of our Information Engineering courses.

Course	Date	Location	Price/Student
IE/ Planning	May 6-9	Chicago	$ 895.00
IE/ Analysis	Feb 4-8	Atlanta	$ 895.00
	April 15-17	Detroit	$ 895.00
	May 13-15	Los Angeles	$ 895.00
	June 5-7	New York	$ 895.00
IE/ Design	March 4-6	Atlanta	$ 895.00
	May 20-22	Detroit	$ 895.00
	June 17-19	Los Angeles	$ 895.00

For more information about our offerings, please contact the CEC Education Coordinator at
(313) 569-0900
cec
"The IE Practitioners"
18620 W. 10 Mile Rd. • Southfield, MI 48075-2667

Dr. Carma McClure
Dr. Peter Chen Dr. E.F.Codd
Capers Jones Vaughan Merlyn
CASE User Panels Vendors Exhibit Booths Nine Additional Speakers
ORLANDO FEB 25-27
APRIL 8-10 CHICAGO
for the 1990s
"The" CASE event of the year
IS R&D™
IS Re-engineering
IS Repositories
IS Reusability
Extended Intelligence, Inc.
Registration Line - (312)-946-7000

For Corp Information Centers/ Training Companies
• PC Lan (Multi-User)
• Student Signups
• Invoicing
• Scheduling
• Management Reporting
Free Demo Disk
Call (919) 469-0071
Computer Decisions
PO Box 80884
Raleigh, NC 27623

Instructor-Led Mainframe Training and Development for IBM and related products.
interact
INFORMATION SERVICES INC
914-332-6100
(Within NYS)
800-628-5471
(Outside NYS)

COMPUTERWORLD
TRAINING SECTION
(800) 343-6474

COMPUTERWORLD
Training Pages give you cost-effective reach!

That's because *Computerworld's* training Pages give you the most widespread reach available to management and staff in America's IS departments - the departments that directly control America's IS training dollars.

And for good reason *Computerworld* is the *best read publication* in America's IS departments - the departments that directly control nearly 80% of the $233 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more *Computerworld's* Training Pages lead buyers to your ad with a weekly Training editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling SQL for MIS pros," or "Finessing the training contract," *Computerworld's* Training Pages deliver pertinent, advice-oriented editorial to *Computerworld's* readers every week.

COMPUTERWORLD
Where all computer buyers and sellers go to market.

NEWS SHORTS

Fire shuts down Wall St. system

Trading on Wall Street was delayed for over two hours last Thursday as a fire and explosion shut down the Manhattan building that houses the data center at Securities Industry Automation Corp. (SIAC). SIAC, which serves the New York and American Stock Exchanges, said it was ready to handle trades by 9:30 a.m, but health officials closed the building because of concerns about airborne contaminants released by a damaged transformer. Citicorp, Chemical Bank and other financial firms also have major data centers in that building.

DG trims Asparagus

Data General Corp. recently said it ended its joint network development contract with Nippon Telegraph and Telephone in Japan. Launched in August 1987, the $100 million-plus project, code-named "Asparagus," was terminated on December 5 by both parties, said DG, which plans to use the technology in future Integrated Services Digital Network products.

Cullinane joins Sentry board

Cullinet Software, Inc. founder John Cullinane is back in action, this time as a director of Sentry Publishing Co., which publishes technology-related magazines and newsletters. He will also head a joint venture with Sentry, to be called The Cullinane Group, which will provide publications, conferences and other services for information systems managers.

Ameritech acquires services vendor

Ameritech and Knowledge Data Systems, Inc. signed a late-December aquisition contract worth approximately $26 million. San Francisco-based Knowledge Data, which specializes in IS services to the health-care industry, will operate as a division of Ameritech Information Systems, the IS arm of Ameritech. It reported revenue of $12.8 million in 1990.

Amtrak cleared of VDT negligence

A federal court jury has cleared the National Railroad Passenger Corp., known as Amtrak, of charges that it failed to provide a safe workplace for employee Debra Haririnia, who blamed intensive work at a computer keyboard for her disabling wrist ailments.

Suit claims Dbase overcharges

Just days after a federal judge declared the copyright to its flagship Dbase product invalid, Ashton-Tate Corp. was hit by a class-action suit from a group of users who feel they were overcharged during the company's reign as lord of the Dbase world. The lawsuit — filed by the Plymouth Meeting, Pa.-based group Rudolph, Palitz — asks for unspecified damages for anyone who licensed Dbase products before the Dec. 14 copyright decision.

Zenith Data CEO steps out

Citing changes in his position resulting from the Groupe Bull buyout a year ago, Zenith Data Systems Chief Executive Officer John P. Frank recently announced his resignation.

AT&T vows to continue NCR purchase attempt

BY ELLIS BOOKER
and MICHAEL FITZGERALD
CW STAFF

Whether heartfelt or not, NCR Corp.'s acrimony toward AT&T has grown steadily since the giant telephone company expressed its desire to buy NCR in December. Over the past weeks, NCR has made several defensive moves, from enlisting congressional support for its case to filing a lawsuit against AT&T.

However, AT&T officials said they will not participate in the war of words.

"This disparagement campaign is not going to make us go sway," said Robert M. Kavner, head of AT&T's Computer Systems group. Kavner claimed AT&T will have higher growth in 1990 in the computer segment of its business than most computer companies, including NCR.

A merger will allow AT&T "to grow it at a greater rate than we could do in a short time organically," Kavner said.

In the interim, Kavner said his senior management team is preparing for "the best transition [that] has ever been done." In particular, he said, work is going on at AT&T Bell Laboratories to "identify what technologies we have that could be brought forward in the product line of a combined business."

Kavner was more careful regarding NCR Chairman Charles E. Exley Jr.'s threat, published in *Computerworld* Dec. 17, that he would "ax" a variety of AT&T's computer products — notably its 3B2 minicomputer family — should NCR's management team be given control of the merged operation.

"The mindset that he has is not the one we had envisioned when we said NCR management would have the authority to oversee the transition," Kavner said. He argued that Exley will not abandon the 3B2 once he sees the economics of the business and the future products planned for the 3B2 line.

AT&T's Kavner says *the firm will continue NCR acquisition battle*

Wait and see

AT&T now waits to see how many NCR shareholders will return proxy statements favoring the merger by a Jan. 15 deadline. AT&T needs 25% to force a special meeting of NCR's board.

NCR's defensive maneuvers have been varied. On Dec. 14, the same day that the board formally rejected AT&T's $90-a-share cash bid, Dayton, Ohio-based NCR filed a lawsuit in U.S. District Court for the Southern District of Ohio alleging that AT&T's filings in its tender offer were "false, manipulative and misleading."

NCR recently retained Goldman, Sachs & Co., a New York investment house. Analysts said NCR hired Goldman, Sachs in addition to its regular adviser, Dillon, Read & Co., Inc., because of its extensive international contacts, raising speculation that NCR would seek a "white knight" overseas. Congress is also getting into the act. Letters have been sent to U.S. Attorney General Richard Thornburgh urging a review of AT&T's plans for antitrust conflicts. Letters have also been sent to the head of the Federal Communications Commission, which regulates AT&T's long-distance business.

A third letter written by Representative Tony Hall (D-Ohio) is being circulated for signatures and will be sent to President Bush for referral to his Council on Competitiveness.

Finally, playing on AT&T's desire to keep NCR's management intact, Exley has threatened to leave the firm if the takeover goes through. Other industry observers continue to bet that AT&T will raise its $90-per-share cash offer to appease NCR's management and quickly complete the merger.

DEC still ironing out VAX 9000 wrinkles

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Mainframe growing pains had Digital Equipment Corp. officials reaching for the aspirin in late December, as reports surfaced about a hardware defect that repeatedly crashed some systems. Also stirring up concern were proposed changes in software licensing fees and a job switch for DEC's senior mainframe executive.

While the bug affected only four or five machines out of the first 75 shipped from July to September, DEC officials said they dispatched field engineers to all 75 sites to replace the multichip unit causing the trouble.

The multichip units are a core technology in the VAX 9000 and are comparable to IBM's Thermal Conduction Modules in its 3090 mainframes. The faulty multichip units were causing system crashes at sites with "very heavily loaded I/O and computation going on simultaneously," said Peter Ross, product manager for the VAX 9000.

"Our first inclination on this glitch is that it's not a problem," said George Kerns, vice president of information services at Contel Cellular, Inc. in Atlanta.

Even for customers untouched by the bug in the multichip units, "frustration" is often among the first words they use to describe their experience with the new mainframe. "We haven't experienced the glitch, but we've had other problems like our power supplies blowing up," said George Singer, VAX section manager at Aerospace Corp. in El Segundo, Calif.

DEC is also facing personnel adjustments. Robert Glorioso, the executive in charge of mainframe business, will remain vice president of the Information Systems Business unit but give up engineering responsibilities for the VAX 9000, a spokesman said.

Analysts and DEC insiders said in late December that mainframe hardware development responsibilities would likely end up with William Demmer, the vice president responsible for all midrange VAX systems and VMS development.

DEC will also change its software licensing procedures in 1991 to deal with reports of customer "sticker shock."

Developing a way to "meter" software use or expanding its present license management facility are two ways in which DEC is approaching the problem, said Mary Welch, DEC software business marketing manager.

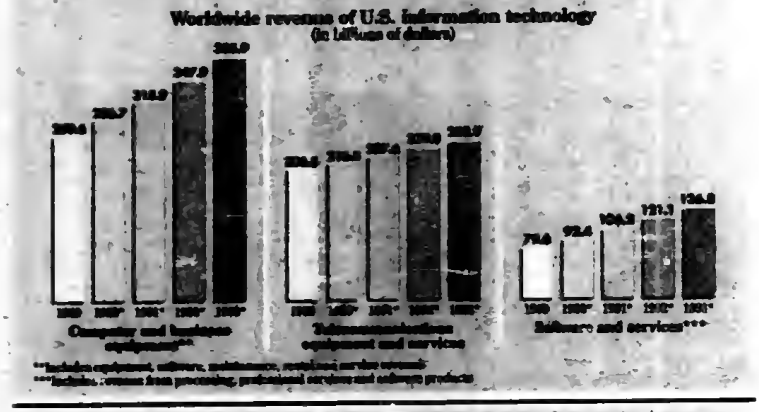
Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed; back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.
Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. For Back issues contact Margaret McIndoe.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

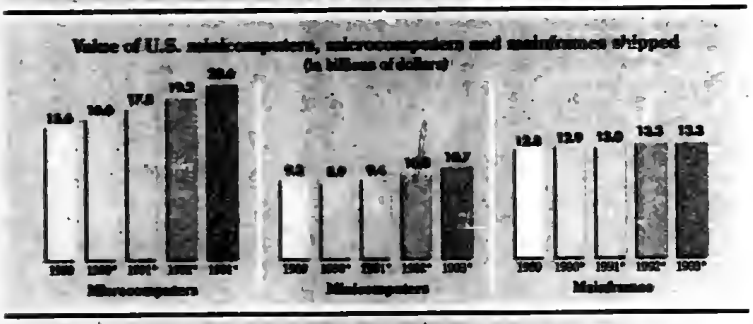
ABP

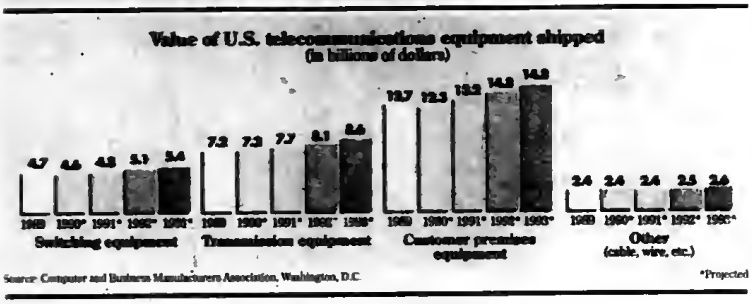
POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

TRENDS

INDUSTRY OUTLOOK







Source: Computer and Business Manufacturers Association, Washington, D.C. *Projected

NEXT WEEK

Keith Williams is one of the world's more unusual chief information officers, but he fits in perfectly with the alternative corporate lifestyle of Vermont-based Ben & Jerry's Homemade, Inc. However, Williams faces many of the same challenges as his pinstriped brethren, such as user resistance to change. He is profiled in Manager's Journal.

Stella Johnson

There's a lot more to changing architectures than shopping for new technologies. Developing a plan that makes sense and creating some momentum behind it are the hard parts. Figuring out how to move ahead without disrupting critical business functions is even harder. Read Executive Report to find out how to perform these tricky maneuvers.

INSIDE LINES

Out with the new . . .

1990 was definitely not the year of OS/2, which many in the industry would say was all but killed off as a viable competitor in the PC market. One member of the Microcomputer Managers Association says IBM has only itself to blame. Presentation Manager, he says, had to be compatible with IBM's mainframe graphics application programming interface. IBM demanded that Presentation Manager "be capable of running on a 286 and not detect or take advantage of 386 capabilities," he claimed. IBM had to do this because it had just sold millions of the 80286-based Personal System/2 Model 50s by telling customers that it was the perfect machine for OS/2.

. . . and in with the old?

After spending one year licking its wounds, Wang Labs seems poised once more to try and make the leap from its famed dedicated word processor tradition to the PC reality. Upword, an "advanced," Windows-based word processor for PCs, is making the beta-test rounds and is said to be close to shipping. The package requires a PC 200/300 with 640K bytes of random-access memory and a 20M-byte or greater hard drive. A plus for hard-core Wang WP users, the new interface reportedly does not require a mouse. More than 225 software changes have been made so far, based on beta-test input. To ensure upward continuity for Wang WP and WP Plus users, the package retains many Wang editing features.

Roasting on an open fire

U.S. Bell operating companies partnered with CATV companies are all set to overrun the UK network market if the government's Duopoly Review results, as expected, in further deregulation. According to one consultant, however, this will simply result in chaos as users struggle to keep track of who provides local service at what price in which district — and perhaps having to install several types of telecom equipment. Meanwhile, British Telecom is keeping ahead of its growing host of rivals by announcing support of IBM's computer-to-PBX link, Callpath, so that its users can hook their incoming calls to IBM host databases — just like in the U.S.

Joy to the world

Application Configured Computers, Inc., an antivirus software publisher and computer security consulting company, is trying to interest the Department of Defense, among other government agencies, in a computer virus that imperceptibly alters a monitor's refresh rate, thereby triggering a headache in the targeted operator. "It's a nonlethal weapon" that could be used against radar operators and others, says Tom Sobczak, a vice president at Application Configured Computers.

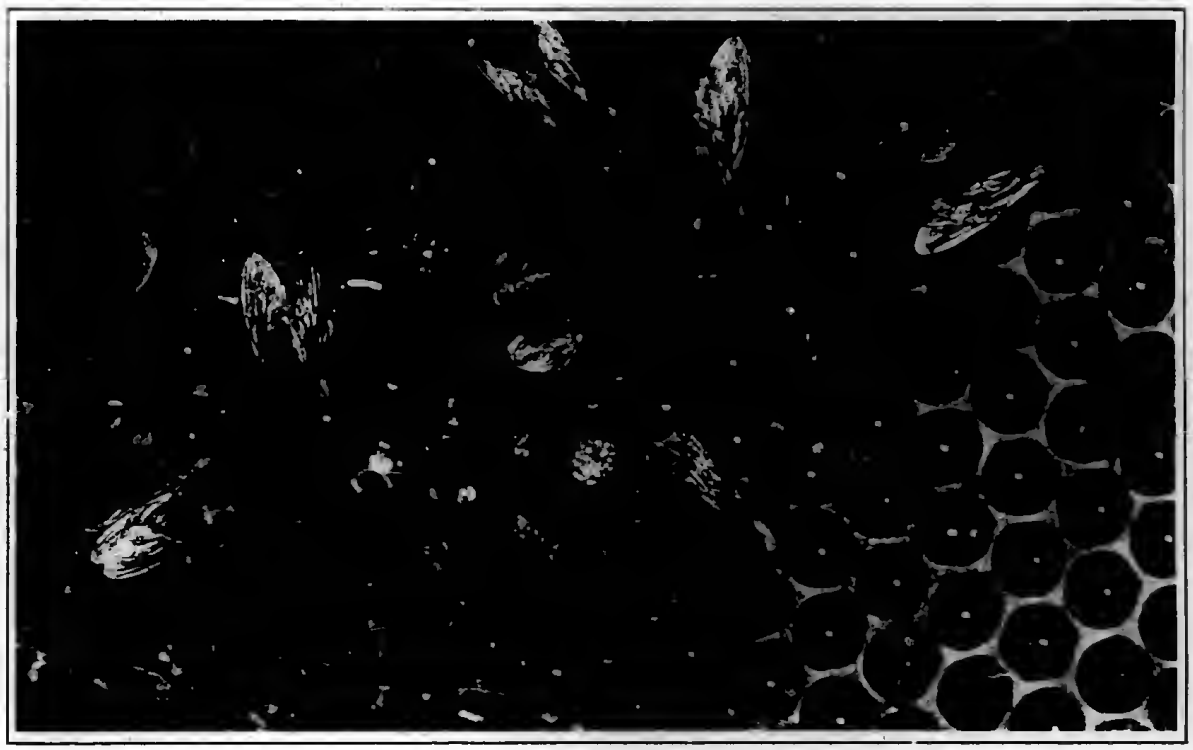
Ring in the new chief?

One very reliable source offered up this observation: "A headhunter I know tells me that Bachman Information Systems is quietly looking for a new chief executive officer, and the two leading contenders for the job are Jim McCormack and Frank Dodge." The public relations firm representing Bachman Information Systems, a Mass.-based CASE vendor, says current CEO Arnold Kraft isn't talking about stepping down, and the firm is "meeting and beating" projected numbers.

An oft-told fable

Connectivity will be the buzzword for Apple Computer at January's Macworld/San Francisco. The Cupertino, Calif.-based company plans to unveil a pair of Ethernet connectivity cards, one for the recently announced Macintosh LC and another for its Macintosh II family. Several transceivers, as well as an updated version of Apple's X-Window software for its A/UX Unix offering, will also debut.

News Editor Pete Bartolik is ringing in the New Year with a new toy to review and is looking for a few good helpers. A fax board is in place and is all set to try out, so jot down this alternate CW fax number: (508) 620-7721. If you'd prefer to stick with the tried and true, the standard CW fax number is (508) 875-8931. For those who scoff at fax pollution, send your New Year's tips via MCI Mail, addressed to COMPUTERWORLD, *or just call (800) 343-6474.*



How come some manufacturers can stay busy even in the toughest times?

Order-Driven Software to Maximize Productivity and Minimize Waste

In lean times, competition intensifies and only the fittest survive. That's why you need JOBSCOPE, the job-oriented software.

You know that every order involves different material requirements. You can't forecast these—yet conventional MRP software *expects* you to. Put JOBSCOPE to work and get the power over both information and time to manage manufacturing literally from minute to minute.

It helps you do a better job of planning and tracking materials, labor and capacity.

Call us for your **FREE** report ***"Improving Market Responsiveness with Computerized Factory Management."*** Learn for yourself how the right manufacturing software can sweeten up your bottom line.

JOBSCOPE™

The Software Standard for the Order-Driven Business

IBM Business Partner
Authorized Cooperative Software Supplier

JOBSCOPE Corporation, 555N. Pleasantburg Drive, Suite 214
Greenville, SC 29607-9960

800-443-5794

How to make the work go faster and the money go slower.

NEC PowerMate 386/25S. The affordable entry to high performance 386 processing

For advanced applications like CAD/CAM, presentation graphics or financial modeling, you can't go wrong with the PowerMate® 386™/25S. For far less than comparable 386 systems, you get 25MHz speed, 2MB of RAM (easily expandable to 16MB via SIM modules) and a 32K memory cache. You also get something you can't get from anyone else at any price: NEC. For more information call 1-800-NEC-INFO.

C&C

NEC